JPRS 76244

18 August 1980

Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 56

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NUCLEAR ELECTRIC ENERGY GENERATION CAPACITY, PRODUCTION

Rome NOTIZIARIO COMITATO NAZIONALE PER "'ENERGIA NUCLEARE in Italian Apr 80 pp 20-21

[Tables compiled by Elga Borri: "Production of Nuclear Electric Energy in the World"]

[Excerpts]

Paese/Impianto	Potenza (MWe lordi)	10^3 kWh (gennaio)	10^3 kWh (totali dalla loro messa in funzione)
ARGENTINA			
Atucha	357	263.908	13.613.300
BELGIO			
Doel (2 x 412)	824	504.200	26.803.280
Tihange-1	920	676.000	26.987.390
Totale	1.744	1.180.200	53.790.670
CANADA			
Bruce (4 x 800)	3.200	1.993.100	47.083.130
Douglas Point	220	100.050	11.618.337
Pickering (4 x 542)	2.168	1.488.770	117.735.930
Totale	5.588	3.581.920	176.437.397
COREA DEL SUD			
Kori-1	587	110.480	5.058.226
FINLANDIA			
Loviisa-1	465	349.231	9.290.416
Olkiluoto-1	683	473.167	4.166.751
Totale	1.148	822.398	13.457.167
FRANCIA			
Bugey-1	555	343.970	22.804.090
Bugey (4 x 957)	3.828	2.675.660	17.351.030
Chinon-2	240	156.038	18.766.555
Chinon-3	415	149.670	20.162.861
Chooz (Sena)	325	231.000	19.883.000
Fessenheim (2 x 930)	1.860	1.246.050	24.126.882
Marcoule (2 unità)	88	48.300	10.662.139
Monts d'Arrée	75	48.360	4.604.077
Phénix	250	104.800	7.096.230
St. Laurent-des-Eaux-1	475	193.231	26.453.614
St. Laurent-des-Eaux-2	530	321.696	27.987.494
Totale	8.639	5.518.725	200.057.972
GERMANIA OCC.			
Biblis A	1.200	778.455	36.637.535
Biblis B	1.300	473.410	22.471.414
Brunsbüttel	806	0	6.989.380
MZFR	57	42.471	4.173.352
Neckar	856	452.293	16.913.943
Obrigheim	345	243.450	26.852.630
Ohu	900	610.634	8.591.778
Stade-1	662	490.208	38.852.168
Unterweser	1.300	975.809	10.427.238
Würgassen	670	382.276	17.433.626
Totale	8.096	4.450.006	189.343.044
GIAPPONE			
Fugen	165	122.760	[illegible]
Fukushima-1	460	0	[illegible]
Fukushima (4 x 784)	3.136	[illegible]	[illegible]
Fukushima-6	1.100	[illegible]	[illegible]
Genkai	559	411.676	16.299.592
Hamaoka-1	540	0	10.417.847
Hamaoka-2	840	624.890	7.955.167
Ikata	566	421.060	[illegible]
Mihama-1	340	52.766	5.993.040
Mihama-2	500	0	16.311.041
Mihama-3	826	607.365	14.229.445
Ohi (2 x 1175)	2.350	861.170	11.700.207
Shimane	460	329.358	17.019.269
Takahama (2 x 826)	1.652	1.202.904	35.828.728
Tokai-1	166	99.796	12.767.695
Tokai-2	1.100	603.695	9.955.395
Tsuruga	357	249.240	19.151.877
Totale	15.117	8.012.760	258.395.913
GRAN BRETAGNA			
Berkeley (2 unità)	334,4	180.000	38.502.000
Bradwell (2 unità)	374,1	99.000	36.984.000
Calder Hall (4 unità)	240	128.168	34.993.374
Chapelcross (4 unità)	240	166.901	34.994.436
Dounreay PFR	250	0	810.760
Dungeness A (2 unità)	576,6	75.000	45.371.000
Hinkley Point A (2 unità)	663,9	329.000	49.404.000
Hinkley Point B (2 unità)	1.320	655.000	13.431.000
Hunterston A (2 x 169)	338	216.196	39.035.113
Hunterston B (2 x 660)	1.320	221.050	9.899.020
Oldbury (2 unità)	633,5	313.000	34.962.000
Sizewell (2 unità)	652,5	336.000	49.892.000
Trawsfynydd (2 unità)	584,8	320.000	46.548.000
Windscale AGR	32	23.991	3.434.592
Winfrith SGHWR	100	76.711	5.694.824
Wylfa (2 unità)	1.352	562.000	37.629.000
Totale	9.011,8	3.704.017	481.565.429
INDIA			
Rapp-1	220	118.247	4.012.446
Tarapur (2 x 200)	400	96.855	19.599.397
Totale	620	215.102	24.211.843
OLANDA			
Borssele-1	472,6	343.350	20.462.405
Dodewaard	54	37.170	4.195.546
Totale	526,6	380.520	24.657.951

1) Paese/Impianto	2) Potenza (MWe lordi)	3) 10³ kWh (febbraio)	4) 10³ kWh (totali dalla entrata in funzione)
PAKISTAN			
Kanupp	137	0	2.913.934
SPAGNA 14)			
Garona	460	88.100	23.082.750
Vandellos	497,4	139.580	25.378.913
Zorita	160	105.500	11.414.600
Totale	1.117,4	333.180	59.876.263
SVEZIA 15)			
Barsebaeck (2 x 580)	1.160	740.920	26.740.692
Oskarshamn-1	460	299.048	19.720.239
Oskarshamn-2	580	408.963	20.081.296
Ringhals-1	780	535.950	16.477.988
Ringhals-2	840	444.834	21.549.955
Totale	3.820	2.422.913	104.570.170
SVIZZERA 16)			
Beznau (2 x 364)	728	514.080	46.267.750
Mühleberg	336	233.680	18.115.320
Gösgen	970	448.600	4.801.500
Totale	2.034	1.197.350	69.184.570
TAIWAN			
Taipower I (2 x 636)	1.272	689.335	10.841.930

Key:
1) Country/plant
2) Capacity (gross MWe)
3) 10^3 kWh (January)
4) 10^3 kWh (total from beginning of operation)
5) Belgium
6) Total
7) South Korea
8) Finland
9) France
10) West Germany
11) Japan
12) Great Britain
13) Holland
14) Spain
15) Sweden
16) Switzerland

Production of Nuclear Electric Energy in Italy

17) Impianto	18) Ubicazione	2) Potenza (MWe lordi)	19) (marzo) (10³ kWh)	20) (31 marzo 1980) (10³ kWh)
Garigliano	Campania	160	0	12.476.392
Latina	Lazio	160	118.618	18.876.631
Trino	Piemonte	270	0	19.082.018
Caorso **	Emilia	860	404.224	2.350.525
	Totale	1.450	522.842	53.390.530

Key:

17) Plant	19) (March) (10^3 kWh)
18) Location	20) (31 March 1980) (10^3 kWh)

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*Does not include the energy total for Gundremmingen (15,981,924 10^3 kWh), definitively closed in January.

** At full capacity, from 3 March 1980.

8255
CSO: 5100

N-PROJECTS LAGGING--Islamabad, July 22--Quoting official sources in New Delhi, the United News of India has reported that work in almost all projects of the Indian Atomic Energy Commission is behind schedule. The agency said that at least half the projects were four years behind schedule. The cost of the implementation of many projects had become double. The projects included research reactors, radio and chemistry laboratories, nuclear fuel systems, heavy water units and atomic energy stations.--APP [Text] [Lahore THE PAKISTAN TIMES in English 23 Jul 80 p 5]

MORE 'ATOMIC' POWERPLANTS--The Prime Minister informed the Rajya Sabha today that as soon as field trials are over the government will encourage production on a massive scale of water pumps operated by solar energy. Intervening during question time in the Rajya Sabha, Mrs Gandhi said that a national committee had been set up under the Department of Science and Technology to oversee the research and progress in the use of solar energy in day-to-day life. The Prime Minister also informed the house that more atomic powerplants will be set up during the sixth plan period. She said details in respect of the number of atomic power stations and cost factors are being worked out. But the process of setting up at least one such plant during the current financial year itself is on the card. Mrs Gandhi said each station will have a power generating capacity of 470 megawatts. [Text] [BK310954 Delhi Domestic Service in English 0830 GMT 31 Jul 80]

CSO: 5100

BRIEFS

NUCLEAR POWER PLANT PARTS--Westinghouse Electric Corp. has reaffirmed its commitment to the economic development of Korea with the recent execution of an agreements with Hyundai Heavy Industries for the local manufacture of certain nuclear power plant components. Robert E. Kirby, chairman of Westinghouse, announced yesterday that the corporation was actively pursuing other potential business development areas in addition to power equipment. Kirby said that agreements, subject to the approval of the Korean government, had been reached between Westinghouse Nuclear Korea, a subsidiary, and the nuclear power division of Hyundai Heavy Industries for the manufacture in Korea of portions of the reactor systems and turbine generators for Korean nuclear power plants. Westinghouse has confidence in the future of Korea as a sound country for investment and plans to actively assist Korean industry through investment or technology transfer, Kirby said. Several years ago Westinghouse established Westinghouse Nuclear Korea in Seoul with M. Gene Lim as president to facilitate the nuclear development program in Korea. In addition Larry North has recently been appointed president of Westinghouse Electric SA in Korea with responsibilities for developing other suitable investment opportunities outside of nuclear field for Westinghouse directly or with other Korean companies. [Text] [Seoul THE KOREA TIMES in English 11 Jul 80 p 7]

CSO: 5100

PROMINENT SCIENTISTS VOICE CRITICISMS OF NUCLEAR PROGRAM

Rio de Janeiro JORNAL DO BRASIL in Portuguese 13 Jul 80 p 30

[Text] Although scientists who work for government-related entities generally attribute criticisms of the nuclear program and the agreement with the FRG to a "half-dozen scientists" who are jealous because they were not asked to participate in decisions, statements by scientists from the most diverse areas, directly or indirectly related to nuclear energy, show a concurrence of contrary opinions. Of 11 scientists interviewed by JORNAL DO BRASIL, only 2 spoke favorably of the nuclear program, without any restriction.

The criticisms are unanimous in regard to nonparticipation by Brazilian scientists in preparing the nuclear program and now in carrying it out. And it is precisely this failure to utilize Brazilian capability that leads these scientists to doubt Brazil can successfully acquire effective technological competence in the nuclear field, with sufficient independence to create new technologies and not simply adapt imported technology.

The statements make explicit some major criticisms of the program and the agreement, but the position of the scientific community as a whole was expressed at the Brazilian Society for the Advancement of Science (SBPC) meeting that ended yesterday in Rio de Janeiro. At a round-table discussion of the nuclear program Tuesday attended by about 1,000 scientists and students, not a voice was raised in support of the nuclear program. Thursday the SBPC general assembly passed a motion favoring suspension of the program until a plebiscite is held to decide whether it should be continued.

Physiologist Says Nothing Justifies the Risk

Belo Horizonte--"Whatever may be the agreement for developing nuclear energy, it does not justify the risk to which it will expose the population. It is either an irresponsible act or a narrow and nearsighted view of the energy problem. It serves no purpose and those who support such views should visit a cancer hospital to learn what the disease is like. Maybe then they will think twice before deciding."

These are the feelings of Wilson Teixeira Beraldo, professor of physiology at the Minas Gerais Federal University Institute of Biological Sciences [ICB], vice president of the Brazilian Society for the Advancement of Science (SBPC) until 1979 and one of its founding members. He adds that he does not yet know anyone within the Brazilian scientific community who would favor development of nuclear energy in this country if he really knew the effects of nuclear radiation

Prof Wilson Beraldo believes that no argument can justify installing nuclear power plants in Brazil. He asserts he cannot accept the risk of contamination by radiation and argues that trying to "make" the country in 5 or 6 years is senseless. "It would be better for us to remain without energy but with our health, if it came to that, than to have the comforts of energy without health."

The SBPC member also claims it is false to assert that man has control over generating this type of energy and adds that the present generation may be accused in the future of causing great evil to befall future generations. "Our professional and ethical duty would, in principle, be opposed to living beings human or animal."

Mr Wilson Beraldo, 63, now retired from the ICB but pursuing research there on a grant from the National Research Council, again mentions that those who have had a case of cancer in their families and know the suffering and mental depression that accompany the disease would not run the risk of advising installation of nuclear energy.

Scientific Community Is Also Questioned

Ildeu de Castro Moreira, young physicist at the Rio de Janeiro Federal University [UFRJ] Institute of Theoretical Physics, criticizes not only the government's nuclear program but also the attitude of the scientific community itself which, in his opinion, analyzes the nation's energy problem superficially.

"No one, not even the SBPC, questions the fact that 80 percent of the energy consumed in this country is spent for nonessential purposes," he says. "The bulk of the population consumes very little energy. Most of the energy consumed in Brazil is not used to meet the real needs of the population," he adds.

He contends that this should be the essential point to be analyzed when talking about nuclear energy. "First of all we must discuss what this energy will be used for. And only then discuss whether or not the nuclear program is good or necessary," says Ildeu.

He recalls that at first many physicists favored the nuclear agreement with the FRG. And they only began to take an opposing position "when they saw that this agreement would not open new prospects for scientific research." The same thing happened with domestic industry, he continues, because at first Brazilian industrialists favored the program and only began to criticize it when they saw that the major orders would be given to large international groups. "It is for this reason that all criticisms made of the nuclear program remain superficial, and only see the tip of the iceberg," the UFRJ physicist says. In his opinion, the ecological groups that began to emerge recently, aroused mainly by installation of nuclear energy in Brazil, have brought a new contribution to discussion of the problem, since their thinking is more long-term. "But even they are deficient in not realizing how political this question is," he warns. And he explains: "Until now, for instance, no one has thought about the nuclear-plant worker or the population living near the plant, especially the poor population, those who simply are not in a position to pick up and leave for a more distant location." Or the possibility of a strike in a nuclear plant: "Imagine a strike in a nuclear plant. This is a problem that is already arousing concern in Europe. But in Brazil nobody thinks about it. A nuclear plant cannot be simply shut down should its employees decide to stop working and, hence, this requires mechanisms for much more repressive control by the government. But no one seems concerned about this."

In criticizing the scientific community, Ildeu condemns the "elitist position of the scientists who, for instance, are not concerned, through their representative entities, in providing information about nuclear energy to the public in language accessible to all."

Geneticist Wants More Discussion

"Nuclear technology is a technology that has some serious problems. A decision such as that of installing nuclear energy in Brazil deserves much more study, discussion and participation by those who will suffer its effects, if there are effects. Those who decided to undertake this nuclear program were the same men who decided, for instance, to introduce the 'simonetas' and later said: 'Oh, well, it just didn't work out!'"

These are the remarks of Henrique Krieger, geneticist at the University of Sao Carlos, in criticizing the lack of opportunity not only for the scientific community but also for the public as a whole to participate in decisions about the nuclear program in either preparing the program or now in carrying it out.

Krieger says he is alarmed to see that nuclear activities in Brazil have gone from the experimental-reactor stage, which is where the country was before the agreement with the FRG, to the power-reactor stage without first having gone through the pilot-plant stage. "This is what creates technology," he says, adding that he does not believe in technology transfer, but rather in its creation.

Krieger asserts that Brazilian geneticists do not know whether a place has been reserved for their participation within the nuclear program outlined by the government. "The nation has invested years in training physicists, geneticists and engineers, and not only have such personnel not been recruited to at least provide advice, but they have no knowledge of the facts regarding the nuclear program," he said.

Another geneticist, Prof Pedro Henrique Saldanha of Sao Paulo University, contends that "since none of the scientific community directly related to the nuclear-energy problem was consulted in any phase of preparing or executing the nuclear program, it must be assumed that this installation was planned as a strictly political project."

But Professor Saldanha believes that discussing the scientific community's participation in the nuclear program is no more important than discussing the question of who will have surveillance over this program. "In Brazil, those who propose, plan and build are those who also inspect. This is entirely unacceptable, as no one can be both judge and party at the same time," he says, referring to the fact that the agency having surveillance of nuclear activities in Brazil--the National Nuclear Energy Commission (CNEN)--is subject to the same authority--the Mines and Energy Ministry--to which the other government enterprises and agencies also report in executing the program.

Prof Warwick Kerr of Sao Paulo University says he favors utilizing nuclear energy, but has a quite original position in this respect. He feels the alternative to nuclear energy--hydroelectric power--has the disadvantage of consuming large tracts of land (for building reservoirs), especially if it is intended to build power dams in the Amazon basin.

Professor Kerr thus advocates the idea that "we must develop here in Brazil a technology that permits use of nuclear energy in a city the size of Manaus, for example," because the imported technology was developed to meet the needs of large urban concentrations.

Physicist Criticizes Brazilian Option

Nuclear physicist Ivan Nascimento--who conducts research on nuclear fusion at Sao Paulo University [USP]--criticizes the Brazilian choice of nuclear reactors powered by enriched uranium and cooled by light water. He favors a nuclear program of the Argentine type, natural uranium and heavy water, because, being a simpler technology, it would give Brazil more technological independence.

Prof Ivan Nascimento considers uranium enrichment "the Achilles' heel of the Brazilian nuclear program," since success of installing the nuclear industry and the fuel cycle in Brazil depends upon operation of the "jet-nozzle" enrichment process, which has not yet been proven economical and has not yet functioned in practice. "At the present stage, the jet nozzle is not even useful for military purposes," said Prof Ivan Nascimento.

Secrecy

The USP physicist is another of those who criticize the secret way in which the nuclear program was planned and blames it for "various defects" he finds in the program, beginning with the choice of technology. Ivan Nascimento agrees that "a certain level of secrecy is certainly necessary, as there are many pressures that would have jeopardized preparation of the program and the negotiations with the FRG." But he contends that there are scientists in Brazil who could have been consulted without breaching secrecy and who could have spoken for the scientific community.

The physicist does not know of any participation by Brazilian universities in executing the nuclear program except for personnel training through PRONUCLEAR, a program coordinated by the National Nuclear Energy Commission (CNEN). In his opinion, there are many other fields in which the universities could participate actively. "There are technological adaptations that could be made in the universities," the professor said.

Engineer Considers Debate Beneficial

Sao Paulo--Col Hernani Augusto Lopes de Amorim, nuclear engineer and superintendent of the Nuclear and Energy Research Institute (IPEN), said yesterday that "it may be there are more than six Brazilian scientists opposed to the nuclear agreement, but they are certainly a monority."

This "minority's" opposition, in his view, is due to reasons of a technical and political nature as well as pure jealousy. He stressed, however, that there is no organized campaign against the agreement and that existing disagreements within the scientific community are highly beneficial because, besides stimulating discussion, they demonstrate that we are living in a democracy.

Left Out

For nuclear engineer Alcidio Abrao, IPEN Chemical Engineering Center manager and USP professor, hardly anyone is opposed to national development in the nuclear field, except for some ecologists who are making up a very vicious story. He pointed out that the big problem is that the scientific community is almost entirely unacquainted with the agreement, as the information published in the so-called "white book" is extremely general.

Alcidio Abrao said the scientific community resents having been left out of the agreement. "Many believe that if the agreement, before being signed with the FRG, had been discussed more widely its conditions would have been more favorable to Brazil and would have provided for greater integration of our scientists in the nuclear program."

The IPEN superintendent did not wish to give his opinion about whether or not the nuclear agreement between Brazil and the FRG is good for the nation, if only because he is unfamiliar with many of its terms, but asserted it will facilitate technology transfer to the country in a shorter time. In his opinion the agreement was signed at an opportune time, as conventional energy sources are being depleted rapidly and a program of this type cannot be left for the last minute.

According to Col Hernani Augusto Lopes de Amorim, Brazil's choice of pressurized light water was correct. He mentioned that the large number of these reactors in existence throughout the world prove their high reliability and advanced development. "We are choosing what is best at the moment. We cannot stand still hoping that a new model or a new technology will be developed. When that happens, we will be in a position to make other choices."

The recent accident at Three Mile Island proves, in his opinion, that the technology chosen by Brazil--practically identical--is the safest that exists. "The worst accident that could exist in a reactor occurred there, which is loss of refrigeration liquid, and even so the plant did not explode and there wasn't a single victim. The problem can be overcome without greater consequences."

He is familiar with the Argentine heavy-water reactor, which uses natural uranium. In his opinion, however, the light-water reactor is already more developed and is more reliable.

Physician Does Not Fear Atomic Energy

Belo Horizonte--The coordinator of nuclear medical studies at Minas Gerais Federal University (UFMG) and head of that department at the University Hospital, Prof Viriato Luis de Magalhaes Ferreira, does not fear large-scale application and amplification of nuclear-energy use and says the agreement reached with the FRG can bring great advantages, even in his specific field of practice.

Having practiced in the nuclear medicine field for 20 years, Prof Viriato Ferreira follows the rule that "we must not fear radiation, but rather respect it." And he adds that there are many cases in which this energy can bring great benefits to the population, mainly in treating diseases through peaceful use of radioisotopes.

He also asserts that once Brazilian reactors start production a number of by-products will emerge with broad use in biology, veterinary medicine and other areas. He cites, as a result of purifying uranium, iodine 131, used in medicine for diagnosing and treating thyroid disorders. "Science already knows almost totally the biological effects of radiation which, when applied within limits and in proper amounts, is beneficial to us."

In supporting the Brazilian choice to use nuclear energy, the UFMG professor reports that, according to statistics, the accident rate recorded in nuclear power plants throughout the world is still low in comparison with that of other power sources, such as hydroelectric power, petroleum exploration platforms and so forth.

He also asserts that, although generating nuclear power is still expensive for the nation, the future problems of obtaining and transmitting electric power at great distances will justify the effort made today.

"The nation was, so to speak, between the devil and the deep blue sea and although there is a large investment of money in acquiring this new technology it will result in future benefits," he says. He does not feel free to talk about technical aspects of the Brazil-FRG agreement, because he does not know it in detail.

Better Technology

He also recommends, as future steps the nation should take in this sector, the need for improving uranium technology, with use of highly regenerative thorium generators, which results in a fertile fuel and which will decrease the costs of power production for better system output. Another advance will be the direct conversion of nuclear energy into electric power without the intermediation of thermal power, as well as the prospect of using, at the world level, the process of atomic fusion.

The coordinator of UFMG nuclear medicine studies, in commenting on the sector's development in Brazil, reports that "in technical terms we are still somewhat behind Argentina in use of radioisotopes. But with execution of the agreement we should even pass them." He says that use of nuclear energy in medicine is surrounded by formidable precautions that require the professional to be approved by the National Nuclear Energy Commission in order to practice.

Ivan Nascimento

Jair Carlos Melo

Jose Zatz

Minas Gerais Professor Advocates Restudy

Belo Horizonte--Although he considers it "very important" for Brazil to master the technology of nuclear power generation, physicist Jair Carlos Melo, one of the four founders of the defunct Thorium Group at the Minas Gerais Federal University, believes the Brazilian nuclear program, in the way it is developing, will never enable the country to attain the intended objectives. In his opinion there is still time to restudy it and reevaluate it, an initiative that must be taken bearing in mind the difficulties that inevitably will arise.

"But this must be done with the participation of Brazilian specialists who can contribute and without that of prospective authors of poorly edited and poorly written documents," he says, in referring directly to the document from the Mines and Energy Ministry containing a list of those who are included in a plot against the Brazil-FRG agreement, and which contains his name.

As the basis of his argument about the need for restudy, the physicist asserts it has already been proven that the nuclear power plants based on heavy-water reactors, although they require less investment than the light-water type--the option of the agreement--have been performing better. "The heavy-water ones have greater output, followed by the natural-uranium and graphite reactors and, finally, well down the scale, appear the light-water type."

Prof Jair Melo also mentions that the number of accidents occurring in heavy-water power plants are fewer per reactor than in light-water power plants. But the physicist says the most important thing is that the agreement forgot about what was most essential for the country over the shorter run: independence and self-sufficiency in regard to nuclear fuel.

The former member of the Thorium Group in the early 70's points out that the Brazilian option should have sought maximum flexibility in regard to the type of fuel cycle we should operate. And he adds that even the least informed know the most flexible choice is natural uranium fuel and heavy-water technology.

He stresses that even after the Thorium Group was disbanded new studies he pursued in the area show that at a cost of $2,000 per kilowatt installed in Angra and about $100 for concentrated uranium ore, the kilowatts generated per hour will cost about 4 cents.

"Meanwhile, in a thermal plant powered by coal in the same location, including construction and the cost of transporting the coal, the cost per kilowatt hour generated will not be greater than 2 and 1/2 cents."

Zatz Considers Agreement Unnecessary

Sao Paulo--Prof Jose Zatz of the USP Physics Institute refuted assertions by Rex Nazare, CNEN director, that 80 percent of the scientific community is in favor of the nuclear program and only 6 persons are speaking against it. He recalled that since 1975 every assembly of the Brazilian Physics Society and of the Brazilian Society for the Advancement of Science has ratified its position against the nuclear program. He said that the scientific community meets at these conventions and not in a half-dozen offices.

He expressed direct opposition to the nuclear program, asserting that the country doesn't need it, according to recent evaluations of hydraulic potential by agencies of the government itself that assure the possibility of supply for even the Center-South for over 50 years.

In his opinion, the country should limit itself to keeping up with development of nuclear technology so that it is available when needed. The agreement with the FRG, in his view, is merely a big commercial transaction that was not made to assure absorption of nuclear technology. He asserts that the agreement was one of the biggest selling operations in history and will cost Brazil between $30 billion and $40 billion.

Prof Jose Zatz said the agreement will divert resources that could have been used in solving problems of extreme importance for the Brazilian people. He remarked that the agreement with the FRG has been carried out in a defective and dangerous manner, as large nuclear power plants are being built close to large urban centers.

According to the physicist, it is true that a nuclear power plant cannot be transformed into a bomb, provoking an explosion. But the amount of radioactivity it releases into the atmosphere in case of accident can be much more dangerous than the explosion of an atomic bomb.

Jose Zatz asserted that the nuclear agreement cannot be justified from the national security point of view either, as with $500 million--and not $30 billion or $40 billion--Brazil could produce armaments. "The point is to master the nuclear cycle. Having done this, a few hundred million dollars are enough to produce nuclear goods for wartime use, without the slightest need to build 10 large power plants."

According to Prof Jose Zatz, when the Germans themselves announce publicly that Brazil will not master the whole nuclear cycle until after the eighth power plant is built, completely contradicting statements by Brazilian authorities, it becomes quite difficult to believe that effective technology transfer will result from the agreement.

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CSO: 5100

BRAZIL

SAO PAULO TRAINS PERSONNEL TO REPROCESS NUCLEAR FUEL

Rio de Janeiro JORNAL DO BRASIL in Portuguese 18 Jul 80 p 16

[Text] Sao Paulo--The first step in training technical personnel to work in the uranium reprocessing plant provided in the Brazil-FRG Nuclear Agreement is being taken in Sao Paulo by installing a laboratory for analyzing radioactive material in the Nuclear and Energy Research Institute (IPEN) Chemical Engineering Center.

According to the IPEN superintendent, chemical engineer Ernani Amorim, the laboratory has been functioning for 2 months, although analyzing only "cold material" (nitric acid, hydrochloric acid and other nonradioactive materials). And now IPEN is negotiating with the National Nuclear Energy Commission (CNEN) to get authorization to work with radioactive materials and begin training security specialists needed for the reprocessing plant to be constructed by NUCLEBRAS [Brazilian Nuclear Corporations].

Sensitive

As with enrichment, uranium reprocessing is one of the most sensitive points of the nuclear-fuel cycle, the IPEN superintendent explains. "In operating nuclear reactors, the risks are much less, because all the radioactive material is contained inside the reactor. In reprocessing, exactly what is done is to open up this material, the products of fission, very radioactive, such as plutonium, for example. So the risks of radiation are much greater. That is the reason for all this concern about reprocessing plants, which can be sensed in the security measures adopted by the U.S. government, for example," he said.

The purpose of the laboratory, which is beginning operations in Sao Paulo with 13 professionals (chemists and chemical technicians), is to analyze radioactive materials in reactors or accelerators to, within 2 or 3 years, train specialized personnel to operate with complete safety the uranium reprocessing plant planned in the nuclear agreement with the FRG. IPEN itself has a research reactor and a linear accelerator, and is also constructing another cyclotron accelerator in the area it occupies at the USP [Sao Paulo University] University City here.

The specialists already working in the small laboratory, the first in Brazil, were trained abroad, mainly in the FRG, and chemical engineer Ernani Amorim sees no problem in terms of professional competence for mastering the technology of security in a uranium reprocessing plant, "really widely published in specialized technical literature."

Prerequisite

Existence of an analysis laboratory is, hence, a prerequisite for operating a reprocessing plant, according to the IPEN superintendent. "When radioactive material is analyzed, it is learned what properties and modifications the material has. In the case of fuel this is even more important, because before reprocessing it must be learned what the requirements for this reprocessing are," he explained.

Although small, the laboratory for analyzing radioactive material being installed in Sao Paulo is within international standards, Ernani Amorim reports. "The CNEN has rules and regulations for standard reporting forms. We are in close contact with the commission while we are preparing our preliminary report analyzing laboratory safety, as any installation of a place where radioactive materials are processed in Brazil can be done only with the express authorization of the CNEN," he said.

Uranium reprocessing takes place after use of nuclear fuel for generating power. In "burning" nuclear fuel to produce a thermal reaction that generates electricity, considerable "unburned" fuel remains. Reprocessing is the technological process used to reclaim this remainder as fuel. The IPEN laboratory will be used specifically to analyze such used material and verify what can be "burned" again and in what proportions.

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ENVIRONMENTAL AGENCY PROPOSES UNDERGROUND NUCLEAR PLANT CONSTRUCTION

Suggestion From Environmental Secretary

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 9 Jul 80 p 25

[Text] Paulo Nogueira Netto, secretary for the environment, will suggest to the bodies involved in the nuclear program--the NUCLEBRAS [Brazilian Nuclear Corporation], CNEN [National Nuclear Energy Commission] and CESP [Sao Paulo Electric Company]--that nuclear plants III and IV to be built in Iguape and Peruibe be constructed underground, which would reduce the contamination and increase safety. This concept was brought from Stockholm, where the secretary participated until early this week in a symposium at which representatives of 12 countries discussed the utilization of underground space.

The plants would be built in artificial caverns, carved out of rocky mountains, according to the secretary of the SEMA [Special Secretariat for the Environment], using Swedish technology and the experience acquired in Cubatao, Sao Paulo, which has the only Brazilian hydroelectric plant in Brazil and one of the first in the world to be built underground. In Rio, however, scientists and technicians participating in the meeting of the Brazilian Society for the Advancement of Sciences (SBPC) regard the concept as unfeasible.

The president of the SBPC and the Brazilian Physics Society, Jose Goldemberg, said that this alternative has been discussed throughout the world as the final solution for eliminating risk to the people and to the environment. "The fact is no country has yet done this," he added, "because the difficulties are enormous, with exorbitant costs and technology not yet developed."

Joaquim de Carvalho, a former director of the NUCLEN [NUCLEBRAS Engineering, Inc], commented that the construction of underground plants might increase the cost per nuclear kilowatt to levels much higher than the present ones because of the new technology required. And David Simon, former director of FURNAS, said that "the idea is good, but there is no proposal yet, and it might take 5 or 6 years for preliminary studies before one would become viable." The United States, England and France, according to physicist

Rogerio Cerqueira Leite, "have tried to implement this concept, but have abandoned it as unfeasible, both from the economic and the technical point of view."

Lesser of Two Evils

"If nuclear plants on the Sao Paulo coast are inevitable because they are necessary, then let them be built underground, as Secretary Paulo Nogueira Netto proposes. Within the earth, the threat to ecology would be less." This was the reaction of Ernesto Zwarg, president of the Itanhaem Ecology, Tourism and Landscape Society, with support from Eduardo Monteiro da Silva, representative of the Peruibe Municipal Defense Committee and president of the Union of Aldermen of the state of Sao Paulo.

In any case, both said they would prefer that the plant not be built. And Zwarg added: "I am not a technician capable of judging the problem, but at first glance, at least the landscape would be preserved. The destruction of the landscape of the region is extraordinary, and it would thus be maintained, for atomic plants, apart from being dangerous, are very ugly."

In the view of some members of the Iguape Society for the Defense of the Environment, the president of the SEMA is concerned only with the visual aspect. "The government may be unable to implement the first plan, much less the second," said Luis Roberto de Oliveira Fortes, a member of the society. He commented further that "if this technique were viable, all countries would be using it, which is not the case."

Theoretical Description

According to Paulo Nogueira Netto, the building of nuclear plants underground in accordance with the technology described at the Stockholm meeting occurs "more or less" as follows: rock is taken out of the interior of rocky mountains to create artificial caverns, within which the plants are built. There may be just a part of them underground, the balance, involving no major risks, being on the surface.

The experts meeting in Stockholm further discussed the construction of safety tunnels, which "carved out of the rock and filled with stones serve to filter all the radioactive gases and vapors, particularly in case of an accident." The 12 nuclear plants in Sweden will have filtering tunnels by 1985, according to Nogueira Netto. Such tunnels were recommended for all countries engaging in nuclear activity.

Campaign of Discredit Fails

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 11 Jul 80 p 26

[Excerpt] Rio de Janeiro--Minister Cesar Cals denounced the campaign waged in the country and abroad to discredit the Brazilian nuclear program, saying it has not modified the government's determination to carry it out, such that the eight nuclear plants will be in operation by 1995.

He dismissed the possibility that a popular plebiscite about the implementation of the nuclear program will be held, saying that no provision was made for that in the legislation governing the sector. Cals also stated that there are already resources, within the budget of the Ministry of Mines and Energy, to pay the necessary indemnifications for appropriation of the land where the nuclear plants will be built on the coast of Sao Paulo.

Concerning the proposal by Special Secretary for the Environment Paulo Nogueira Netto concerning the building of underground nuclear plants, the minister of mines and energy explained that various points need to be examined before a definition is made. The first involves knowing whether such plants are viable in terms of cost, and the second requires establishing whether the higher cost of building underground plants as compared to conventional ones would be balanced by an increase in the safety level.

Minister's Statement Praised

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 16 Jul 80 p 24

[Text] Special Secretary for the Environment Paulo Nogueira Netto stated yesterday that he regards the statement made by Minister of Mines and Energy Cesar Cals as "positive." Cals said he will analyze "with full attention" the proposal that nuclear plants be built underground, as outlined in Stockholm, Sweden, where 12 countries including Brazil discussed the use of underground space last month.

The proposals were made by the secretary for the environment himself and they were sent to all of the bodies involved in the nuclear energy sector as a suggestion for the building of plants III and IV, which will be located on the Sao Paulo coast. To date, according to Nogueira Netto, only the minister of mines and energy has expressed any view about his suggestion, and he is expecting later this week to be in touch with the CNEN and the NUCLEBRAS to learn the position they have adopted on this matter.

The special secretary for the environment also stated that Minister Cesar Cals indicated interest in recommending a study of the "cost-profit" ratio for the building of underground nuclear plants with the pertinent bodies, comparing it with the total financial resources necessary for traditional projects.

In addition to this, Paulo Nogueira stressed, the secretary for the environment will continue talks with regard to the location of the two ecological stations in the same Jureia region, where the nuclear plants will be built. The secretary also stated that the area for the Una River station has been established and the headquarters for that in the Jureia range is already under construction--it is one which can be dismantled in the event that it needs to be moved, although it has already been decided that both will stay in the same place.

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PROSPECTORS DISCOVER URANIUM, THORIUM IN AMAPA

Mixed Deposits Found

Rio de Janeiro O GLOBO in Portuguese 15 Jul 80 p 18

[Text] Brasilia--A mixed deposit of uranium and thorium has been discovered by prospectors in the northern part of the territory of Amapa, near the Tumucumaque Mountains, on the banks of the Araguari River.

Raymunda Lemos Damasceno, a merchant in precious stones and explorer in a prospecting zone on the banks of the Araguari River, brought the laboratory results on two samples of ore to the Ministry of Mines and Energy yesterday. The tests were made by the chemistry department at the Catholic University of Rio de Janeiro and the Geochemical, Geological and Analytical Services Limited firm and they showed a uranium and thorium content.

The study made by the chemistry department at the PUC [Pontifical Catholic University] of Rio de Janeiro, signed by Norbert Miekeley, showed that the sample contained 74.1 percent thorium (THO3) and 8.2 percent uranium (U308). The results of the analysis made by the Geochemical, Geological and Analytical Services, signed by Carlos Eduardo Pinheiro, showed 74.5 percent thorium and 10.3 percent uranium.

Raymunda Lemos Damasceno said that the discovery occurred by accident. His prospectors discovered a deposit which they believed contained tantalite, but on x-ray analysis radioactivity appeared.

The samples of the ore were gathered over a large area near the Tumucumaque range, almost on the soil surface, where the prospecting for tantalite was done. However, he could not give exact dimensions for the area, stating only that it is "extensive."

In 1977, Raymunda Damasceno went to the NUCLEBRAS [Brazilian Nuclear Corporations] office in Brasilia with a report on an x-ray analysis. The employees there were not helpful, and according to Damasceno, they merely advised him to go to the NUCLEBRAS headquarters in Rio. Instead of taking this suggestion, he decided to have the samples analyzed on his own account, and these analyses showed the existence of thorium and uranium.

He returned to the Ministry of Mines and Energy yesterday for the purpose of talking personally with Minister Cesar Cals, but neither he nor the head of his office staff, Gen Luciano Salgado Campos, was there. Officials at the ministry suggested that he apply to NUCLEBRAS again, as it has a monopoly on the exploitation of radioactive ores. He said he planned to visit the office of the enterprise in Brasilia today.

Uranium Not of Commercial Quality

Rio de Janeiro O GLOBO in Portuguese 16 Jul 80 p 19

[Text] The director of research and ore prospecting at NUCLEBRAS, John Forman, confirmed yesterday that the uranium ore discovered by prospectors in the northern part of the territory of Amapa has a "high content," but they explained that the concentration in that region is not such as to make exploitation economical.

A 5-kilogram sample of the ore from Amapa was studied by the NUCLEBRAS itself in October 1977, and it showed 8.8 percent uranium and 46 percent thorium, whereas the uranium content normally reaches about 1 percent.

The uranium and the thorium were discovered by prospectors working on contract for prospector Raymunda Lemos Damasceno. John Forman said that the samples of the ore contained a high uranium and thorium content, but not of the uranium ore which could be extracted on an economical basis.

Pegmatite Ores

"When the matter came up for the first time, we sent a geologist to the region," the director of research and ore prospecting at NUCLEBRAS explained.

"He found that it was really a question of pegmatite ores, a type of rock in which minerals such as tantalite, niobite, beryl, spodumene and some uranium ores occur, as is found in all regions of Brazil, where the pegmatites are worked by prospectors to obtain other minerals. This occurs mainly in Sao Joao del Rey and Salinas, Minas Gerais, and in Pernambuco and Ceara, in the Northeast," John Forman added. "These uranium ores, although common in pegmatite, have no concentration which would justify their economic exploitation."

John Forman said that these explanations were provided to the Ministry of Mines and Energy and other interested bodies and individuals when the matter came up earlier.

Difficult to Believe

Brasilia--Mario Sergio, deputy head of the NUCLEBRAS office in Brasilia, had the following to say after receipt of the two laboratory analyses on which O GLOBO reported yesterday from prospector Raymunda Lemos Damasceno:

"The uranium and thorium contents of these samples are so high it is difficult to believe."

He will attempt to meet with Minister of Mines and Energy Cesar Cals today to present to him documents showing the existence of the two ores in the region.

Raymunda Damasceno said yesterday that there are about 7 tons of the product already taken out by prospectors, thinking that it was tantalite, in the area where the deposit of the ores was discovered. According to him, approximately 3 more tons had already been mined and mysteriously disappeared from the area.

He said that a geologist and a physicist visited the region in 1978 "and were amazed by the radioactivity in the area, which even blew out one apparatus." Claiming concern about his personal safety, he would not give the names of the two scientists.

The analysis of the sample undertaken by NUCLEBRAS was made at the request of the National Nuclear Energy Commission (CNEN), which in turn received a request for analysis signed by engineer Albino M. Regallo de Souza, to whom Raymunda Damasceno had sent the sample. The analysis was signed by chemical engineer Noema G. Alvarenga.

NUCLEMON [NUCLEBRAS Monazite and Associated Elements, Ltd] also analyzed an ore sample on 28 November 1977 which showed figures close to those yielded by the analysis NUCLEBRAS made. The results, stamped confidential, show a uranium content of 9.1 percent and a thorium content of 79.7 percent.

This sample was sent by Raymunda Damasceno to the Sao Joao del Rey Tin Company, which prospects for cassiterite in Amapa. In response to queries about the analysis by that enterprise, the industrial and commercial director of NUCLEMON, Jose Publio Roche Ferreira, said:

"It is in fact thorianite, which because of its high uranium and thorium content, is included under the state monopoly provided by law."

He sent along the results of the analysis as well.

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BRAZIL

PEACEFUL INTENT OF NUCLEAR PROJECTS RECONFIRMED

Rio de Janeiro JORNAL DO BRASIL in Portuguese 17 Jun 80 p 18

[Text] Porto Alegre--"The purpose of the nuclear agreement between Brazil and Germany is peaceful. There is no excessive zeal on the part of the government in stating this. We want to generate electrical energy and the rest is a byproduct," the superintending director of NUCLEBRAS Engineering, Inc (NUCLEN), Ronaldo Fabricio, said. He added that there is "no thought at all of creating an atomic bomb with the nuclear energy, and in fact the method adopted in Brazil does not allow the enriching of uranium to a percentage which would cause an explosion."

He said that in the view of NUCLEBRAS [Brazilian Nuclear Corporations], nuclear energy is not essential in the short run, but the country is making preparations so that "it will be available to replace electrical energy." In addition to this, we are preparing Brazilian industry for development when this becomes necessary, he said.

In an interview at the Piratini Palace, where he set forth to Rio Grande do Sul deputies and scientists the advantages of nuclear energy in Brazil, while at the same time "responding to the insistent criticisms made of the agreement between Brazil and Germany," the director of the NUCLEN, Ronaldo Fabricio, said he does not agree with the holding of a plebiscite so that the people can decide on the location of the atomic plants, as suggested in the proposal by Rio Grande do Sul Deputy Carlos Augusto de Souza (PDT).

Porto Alegre--Unlike State Planning Secretary Maurell Muller, who believes that the Brazilian nuclear project is designed "almost exclusively for national security," the energy factor being secondary, Third Army Commander Gen Antonio Bandeira believes that "our interest in mastering nuclear technology has nothing to do with national security," stressing that recently "Brazil signed an agreement with Argentina, and we have no problem, no potential enemy."

After giving assurance that Brazil will use nuclear technology only for peaceful purposes, he said that "although we do not need nuclear energy as an alternative, because we have water resources, we are acquiring this technology somewhat in advance in order to be prepared for the future, when our current energy reserves are exhausted."

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BRAZIL

MINISTER SAYS NUCLEAR TIMETABLE WILL BE MAINTAINED

Rio de Janeiro O GLOBO in Portuguese 15 Jul 80 p 18

[Text] Minister of Mines and Energy Cesar Cals said yesterday in Rio that the nuclear and hydroelectric plant projects at Itaipui and Tucurui, as well as the interlinking of the electrical systems of the North and Northeast, will not be behind schedule "under any hypothesis."

"If some of the projects suffer cuts in the planned budgets this will not mean that their completion dates will be postponed. Tucurui will be operative in 1982, and Itaipu will be in 1983."

The minister called yet another meeting of the Higher Energy Council yesterday, to discuss the possibility that Brazilian thermoelectric power plants, fueled by oil products, will be adapted to use peat, a substance found in large quantities in this country. Currently a test operation with a small thermoelectric plant in Campos is underway, and if approved, the thermoelectric plants in Manaus will immediately be adapted. Brazil has a reserve of 25 billion tons of peat.

Resources

Cesar Cals said that the cuts in investments established by the federal government will not be made in linear fashion. He explained that the president of the republic set an overall ceiling for all sectors under the jurisdiction of the ministry, and the resources will be distributed in the most desirable manner.

With this flexibility, the cuts in the sector will be dictated by political criteria, even making it possible for some projects not to be affected at all.

At the Energy Council meeting it was established that the completion of the work of interlinking the Northeast and North systems will be effected by next October, when the transmission line being strung from the Tucurui hydroelectric plant will reach Imperatriz, where it will hook up with the

Sao Francisco Hydroelectric Company (CHESF) system. As to the Tucurui-Belem link, it is to be completed in the first half of next year.

Representatives of the CESP [Sao Paulo Electric Company] met with Minister Cesar Cals yesterday to explain the rural electrification program for the state of Sao Paulo. They said that once the program is completed, there will be an annual saving of 85,500,000 liters of diesel oil which are today being consumed for the irrigation of crops alone. According to the CESP technicians, the use of electrical energy for irrigation will reduce the cost of this activity by 68 percent, thus reducing production costs.

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REPORT ON LOCATION OF ANGRA III PLANT DUE IN JULY

Rio de Janeiro JORNAL DO BRASIL in Portuguese 11 Jul 80 p 20

[Text] By the end of the month, Furnas Electrical Power Plants will receive the report on the location of the Angra III nuclear plant from the NUCLEN [NUCLEBRAS Engineering, Inc] and the KWU, and in August the enterprise will have made a decision on the final choice of the site, for submission to the National Nuclear Energy Commission (CNEN) for approval, the president of Furnas, Licinio Seabra, announced yesterday.

The report which the NUCLEN and the KWU are drafting will include a technical and economic analysis of each of the two possible sites for Angra III--the Itaorninha beach, near the site originally chosen, and Ponta Grossa, or Urubu Hill, a little farther away.

The choice of Itaorninha would mean that the plant would have to be built on pilings, like Angra II, which will not be necessary if Ponta Grossa is chosen as a site, since as it is a hill, the plant can be built on rock. Licinio Seabra said that even if Itaorninha is the site chosen, the sinking of the pilings will not present the same problems as were encountered in building the foundations of Angra II, since all of the engineering problems resulting from the existence of the boulder bed--large blocks of stone mixed with sand in the Angra subsoil--which interfered with the foundations of Angra II have now been resolved.

The president of Furnas admitted however that the possible decision to build Angra III on pilings, after all the problems encountered with the Angra II pilings, would certainly "have a great psychological impact" on public opinion. He gave assurance that this will also be taken into account by Furnas when it comes to making the final choice between the two alternatives.

Mr Licinio Seabra believes that there should be no problems in obtaining the approval of the National Nuclear Energy Commission for the site chosen, because although the CNEN does not have to make a decision until the final choice is made, since many talks with the licensing body have been held since the question came under study and in principle, the CNEN has not vetoed either of the two alternative sites.

The president of Furnas said the situation of the enterprise was "very difficult" where the cuts in investments decided upon by the federal government this year are concerned. He explained that the Ministry of Mines and Energy is still studying how and where the cuts will be made, because the 15 percent established by the SEPLAN [Planning Secretariat] pertains to the overall ministry budget and not to each enterprise separately.

According to Licinio Seabra, if Furnas has to make a cut of 15 percent in its investments, it will be forced to sacrifice at least one of the projects it has underway, delaying its commissioning. In the case of Furnas, the difficulty lies in the fact that the projects the enterprise is currently executing are priority projects--the Itaipu transmission line and the Angra nuclear plants.

Another difficulty in establishing the plan for reducing investments is the fact that the time allowed is very short--only 4 months (August, September, October and November, since the expenditures in December will be accounted for in January of the following year).

Licinio Seabra, terming the financial situation of the enterprise as "worrisome," further referred to the fact that in addition to the cut in investments, the budget will also feel the difference between real inflation this year and the estimates used when the budget was drafted. The basic estimate for the period from December 1979 to December 1980 was that inflation would run at 45 percent--which will be substantially exceeded--with an exchange variation of 40 percent, which will also be exceeded.

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BRIEFS

NUCLEAR FUNDING AVAILABLE--The general superintendent of finances for the NUCLEBRAS [Brazilian Nuclear Corporations], Joaquim Osorio Martins Ferreira, gave assurance yesterday after meeting with Central Bank President Carlos Langoni that "there is no lack of money for the development of the nuclear program." Although he made it clear that he was speaking only of financial matters, Martins Ferreira commented that even without an understanding of it, the nuclear program has now become as popular a subject as football. In maintaining the rate of implementation of the nuclear program, NUCLEBRAS has been given priority by the Planning Secretariat of the Presidency of the Republic for contracting for foreign loans. Martins Ferreira explained that the loan applications are on file with the Central Bank awaiting the proper moment for placement on the international financial market. [Text] [Sao Paulo O ESTADO DE SAO PAULO in Portuguese 3 Jul 80 p 30] 5157

ECOLOGICAL STATIONS--In a decree signed today, the president ordered the establishment of ecological stations around all nuclear plants built in the country. The decree, Planalto Palace spokesman Alexandre Garcia said, is a reply to those critics of the Brazilian nuclear program who regard it as a threat to our ecology. Garcia added that in the case of the Sao Paulo nuclear plants, it has already been decided that the ecological stations will cover the entire expropriated area, except for the area needed for the construction of the project itself. [Text] [PY310002 Sao Paulo Radio Bandeirantes Network in Portuguese 0230 GMT]

CSO: 5100

BRIEFS

NUCLEAR SPECIALISTS WANTED--AFP--A prominent publicity announcement appearing in a specialized American magazine, which solicited for nuclear specialists for a Libyan university, has aroused a lively interest of Israeli opinion, which ties this recruiting program with France's sale of enriched uranium to Iraq. Mr Jacques Goldberg, an electrical engineer at the Technion (a technical institute in Haifa) who is originally French, gave the details of this advertisement in an interview given to Israeli Radio. The announcement appeared in the latest edition of SPECTRUM. It made a call on behalf of Al Fatah University in Tripoli for 25 electronics specialists and nuclear physicists and promised excellent remuneration for every post. It requested immediate response, by telegram if possible, to an address in Washington. According to Goldberg all the posts mentioned in the advertisement are essential for the operation of a nuclear reactor. [Text] [Paris LE MONDE in French 25 Jul 80 p 6]

CSO: 4800

ATOMIC PLANT TO BE BUILT FOR MEDICAL STERILIZATION

Johannesburg RAND DAILY MAIL in English 14 Jul 80 p 3

/Article by Henry Harington/

/Text/

AN ATOMIC plant for sterilising South Africa's medical supplies is being built at the Isando industrial complex near Johannesburg.

The process will also be used to improve the quality of cable insulation used in the electronics industry.

The plant — the first commercial undertaking in South Africa based solely on the use of nuclear technology — will be run by Isoster Ltd, and is owned on a 60-40% basis by Federale Volksbeleggings and the Industrial Development Corporation.

The installation, costing R3.5-million, will be operating by the middle of next year.

Since 1971, a pilot plant at the headquarters of the Atomic Energy Board (AEB) at Pelindaba has been used to sterilise disposable syringes, surgical gloves and instruments, bandages and swabs.

Mr A J van den Berg, chairman of the IDC, said last week: "The Atomic Energy Board found the pilot plant so successful that they invited the IDC to tackle it on a commercial scale. There was great interest from overseas concerns, but the IDC decided to form a wholly South African consortium for the project."

Mr A S Barnes, general manager of Federale Volksbeleggings, said yesterday: "In the process, pre-packed medical supplies pass through a chamber where they are exposed to the electro-magnetic energy released by Cobalt 60 in the form of gamma rays.

"Unlike atomic materials used in nuclear power reactors, Cobalt 60 does not leave any residue of radioactivity in an object which has been subjected to its rays.

"The saving in manpower through gamma-radiation has led to increased demand for disposable medical products in hospitals throughout the world," Mr Barnes said.

Plastic disposable equipment melts in steam sterilisation, while the use of potentially explosive ethylene oxide gas is dangerous and not entirely reliable.

Mr Barnes added: "It is accepted throughout the world that if disposable medical products are exposed to a certain amount of radiation, they are unequivocally accepted as sterile.

"The goods are placed in containers and the radiation goes right through them, killing any microbes, so they remain sterile until the seal is broken.

"The process is virtually identical to that used in hospitals when cancer cells in a patient are killed by exposure to a controlled amount of electro-magnetic energy from a 'cobalt bomb'.

"The energy also strengthens the rubber and plastic in disposable equipment. For example, surgeons' gloves are made 10% stronger, and artificial limbs, besides being sterilised, have their abrasion resistance reduced by 30%.

"We will also be able to make cable insulation for the electronics industry stronger and more heat resistant, so the industry will be able to use thinner and lighter cable," Mr Barnes said.

An Atomic Energy Board spokesman said that though South Africa was a leading country in the development of food radurisation, it was premature to discuss its commercialisation.

Discussing the safety aspect of the plant, Mr Barnes said: "There are more than 80 plants like this round the world, but to my knowledge there has never been an accidental emission of radiation. We have to provide a detailed evaluation of the project to the AEB, who will only licence us to operate when they are satisfied it is completely safe. We are also in contact with the Department of Health.

"The cobalt is stored in a concrete structure with 2m-thick walls which significantly exceeds the safety margin required."

Mr Barnes added that there was export potential for gamma-sterilised disposable medical supplies.

CSO: 5100

NUCLEAR RECYCLING PLANT OUT OF SERVICE FOR 18 MONTHS

Hamburg DER SPIEGEL in German 4 Jul 80 pp 164-165

[Article: "Hot Jobs"]

[Excerpt] West Germany's only recycling plant will be out of service for 18 months--a serious consequence of a tiny leak.

[Text] The communication consisted of a total of eight lines. It was sent to the staff employees of the Nuclear Research Center in Karlsruhe to inform them of the incident.

It was on 21 May and the reference was to an "insignificant contamination of the steam heat processing system" and a possible "leak" in the "dissolver" and that an "omission of activity..." is "not expected."

In the meantime, however, it has become apparent: The consequences of the damage are anything but "insignificant." A hole in a heating coil, only a few millimeters in diameter, has caused the shutdown of the only nuclear recycling plant currently in existence in West Germany, and it "will be out of service between 12 and 18 months"--according to a statement made last week by Professor Boehm, member of the executive board of the Nuclear Research Center in Karlsruhe.

In the meantime, even radioactivity has been emitted, although not in alarming quantities. Traces of increased radioactivity turned up in a rainwater drainage canal which flows past the Karlsruhe center.

The cause of the Karlsruhe shutdown is a technical trifle, which would cause little fuss in any normal industrial or power plant: Apparently, a heating coil which was filled with steam heat developed a leak at a welded seam. As a consequence, radioactivity got into the steam heat; the steam (some of which was later emitted into the air) was contaminated with radioactivity.

If the chemical industry, for instance, experiences a similar leak, the damaged heating coil is cleaned of chemicals and repaired or replaced. In the case of Karlsruhe, however, a complicated "decontamination" (cleaning) process is necessary before the damaged part is even accessible to people.

A work program, especially prepared for these repairs, must be planned in advance, detailing practically every move in the radioactive zone to keep the effect of the rays on workers as low as possible.

The Karlsruhe incident is typical of a problem which nuclear technicians have to face with increasing frequency. The longer nuclear plants are in operation and the greater the number that are being constructed, the more frequently are there indications that in this area even the smallest incident can often lead to long-term and costly shutdowns.

The Karlsruhe recycling plant, which since its completion in 1969 has been operated by the German Society for Recycling Nuclear Fuels (DWK), is equipped to recycle approximately 35 tons of used reactor fuel per year. The actual amount that was recycled per year averaged only 10 tons--the reason being, above all, that it is a test facility subject to frequent phases of adjustment.

The tests in Karlsruhe were to try on a small scale what was to function in a "large plant," which according to DWK plans was to be erected near Gorleben. But after Minister President Albrecht rejected the Gorleben atomic factory, there are now plans to erect a recycling plant in Hesse-although it will only be one-fourth of the original size. The estimated construction cost of the project, as presented last week by the DWK: DM 4 billion.

The plant, which at the earliest will be finished in 1990, is to process 350 tons annually--which just about equals the amount of used fuel that will be ejected annually by West Germany's nuclear power plants as early as 1985, accordong to present plans.

The Hesse plant is to operate according to the same principle as has been used in Karlsruhe--the Purex procedure, originally used in military nuclear technology. In "hot cells," shielded behind filters and thick lead glass, untouched by human hands, the highly radioactive material passes through the different steps of the recycling process.

In these mechanical-chemical robot factories, the components of the used heating rods, which still contain usable residues of uranium but also the highly poisonous plutonium and as many as 300 different radioactive isotopes, are separated--into reusable nuclear fuels and radiating waste.

Before they can be processed, the fuel elements have to "cool off" for several years in water tanks that are between 10 and 15 meters deep to radiate the worst radioactivity. Later, in the recycling plant they are first mechanically crushed and then chemically dissolved.

This function is performed by the "dissolver," the part of the plant that was shut down in Karlsruhe. There, the pulverized heating rods were immersed in nitric acid (as a solvent). The acid was heated with a metal coil filled with steam, using the immersion-heater principle.

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CSO: 5100

SOVIET EXPERTS VISIT, HELP PLAN 'SECRET' N-UNIT

Stockholm DAGENS NYHETER in Swedish 20 Jun 80 p 19

[Article by Tor Hognas, journalist: "Nuclear Powerplant Planned in Silence"]

[Text] The planning of a 1000 megawatt giant nuclear powerplant is currently in progress in Finland. For 2 weeks, 13 Soviet experts in nuclear power have been in the country, invited by the power company Imatran Voima. Negotiations have been held in Helsinki in great secrecy.

In Loviisa, where the powerplant is scheduled to be located, people are surprised. Rumors about the Russian visit have leaked in spite of strict confidentiality implemented by Imatran Voima.

A spokesman for Imatran Voima says that he has no idea as regards the purpose of the visit at the nuclear city of Loviisa.

The Russian delegation is on a technical, not trade-policy, level.

Imatran Voima claps on all sail to get a giant reactor from Soviet. The intensive negotiations with the delegation from Atomenergiexport [Atom Energy Exports] are expected to lead to a planning agreement shortly.

The uncertainty in Loviisa is also increased by all minor and major defects being detected in the first reactor after 3 years' running. In the pressure boiler of the second reactor cracks had formed.

In the first reactor the cover of one of the fuel rods had expanded and did not fit into the mounting.

Some experts have the opinion that the defects probably developed through an excessively high temperature in the reactor in March.

There is also mentioning of defects and incidents being detected during service work. In a tube in the primary circuit a protection suit was found. The suit had been there for a year and had done damage to the valves. In the turbine circuit there was a piece of sheet metal of the size 20 times 20 centimeters and so on.

At Imatran Voima it is stated that the cover of the fuel rod obviously was damaged during charging. The only major defect that has been detected regards the welding seams in the circuits of the steam generator.

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CSO: 5100

ANTINUCLEAR OPPOSITION BECOMING A NATIONAL MOVEMENT

Helsinki SUOMEN KUVALEHTI in Finnish 23 Mar 80 pp 46, 47

[Article by Kimmo Pietilainen: "Nuclear Power Discussion Only Beginning--Finland Practices"]

> [Text] Finnish nuclear power discussion is getting underway.
>
> Decision about construction of a new powerplant and revision of the atomic energy law to be made in next few years.
>
> Material for discussion exists in abundance.

Opposition to nuclear power is becoming a national issue also in Finland. The opposition thus far has been concentrated in the localities in which nuclear powerplants have been planned, places such as Iknoo.

The front is broadening. The largest antinuclear power demonstration thus far in Finland was held in Helsinki on 15 March. About 5,000 persons from various parts of Finland participated in it.

The course of the nuclear power discussions in Finland has followed those on the international scene. And, in keeping with the international course, the opinions concerning these powerplants have disrupted the normal delineations between party groupings.

At its most primitive level the discussion about nuclear power has consisted of attempts at intimidation. The supporters of nuclear power promise a return to the stone age if nuclear power is abandoned. The opponnets of nuclear power envision distorted genetic factors from which future generations must suffer unless nuclear power is abandoned.

However, the discussion does involve a realistic and serious basis, and that has to do with the future of our society.

According to the prevailing view, nuclear power is the only energy source, at least for the next few years, that is able to compete with oil and coal. It has a 30-year lead on the so-called "soft" energy sources.

Despite this apparent advantage, the supporters of nuclear power have been forced to make concessions during recent years. Their promises do not conform to reality.

Finland Experiences Start-up Difficulties

The powerplants have been expensive to build. The electricity they produce is not as cheap as promised. It is generally more expensive than the electricity from other types of generating plants.

The nuclear powerplants were said to be so safe that no serious accidents could occur during normal conditions. The leak in the Three Mile Island powerplant in spring 1980 in the United States provided a concrete example of the reliability of that promise.

Nor has it been possible to put the Finnish powerplants into operation according to the plan. Only the Loviisa No 1 powerplant has been in operation for a length of time. The others are still in start-up phases and troubles have caused extensions of the schedules.

International agreements have been unable to limit the proliferation of nuclear weapons. At this moment several countries aggressive by nature, among them Libya and Pakistan, are either building or planning nuclear powerplants, and they could make bombs from the plutonium that these plants produce.

The Hazards of Radiation

The most important hazards, however, are associated with the wastes and the radiation produced by the nuclear plants. Many of the supporters of the powerplants argue that people fear them because they are a new phenomenon and because they cannot be seen.

Practice has demonstrated, however, that the radioactive wastes are harmful. They cause changes in genetic factors and the damage may not become evident until in the children of those who were subjected to the radiation.

Those most affected by the radiation are the workers in the plants. That radiation has been considered to be quite low. Actually, people on the average receive two thirds of the radiation they experience from the background radiation that nature itself produces. Nearly all of the remainder comes from medical treatments.

The most difficult of the radiation hazards is that of storing the powerplant wastes. Many of the wastes will produce radiation even after tens of thousands of years. The safe storing of these wastes is a historically unprecedented problem.

The period of storage is longer than all of the written history of mankind and it requires an entirely new attitude toward the future.

For the time being, the problems of radiation have not been resolved in a way that is satisfactory to everyone. A part of the wastes from Finnish powerplants must be stored in Finland.

At this time the best proposal for the storage of wastes is in the age-old base rock in Finland. It is believed to be so stable that the wastes that are imbeded into it cannot escape into the environment. However, that plan also has critics.

The opponnets of nuclear power feel that the hazards of nuclear power can be avoided only if society tightens its hold on the citizens. Democracy will thus lose its significance and we will shift into a totalitarian society.

But the concern over economic growth will lead to new attempts to procure powerplants. A one thousand megawatt nuclear powerplant is being envisioned for Finland, and the decision concerning that is due to be made within the next few years.

A revision of the atom energy law is being planned at the same time.

The discussion about nuclear energy is only in its beginning at this time.

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CSO: 5100

FINLAND

DEMONSTRATORS MARCH IN LARGEST ANTINUCLEAR POWER PROTEST

Helsinki HELSINGIN SANOMAT in Finnish 16 Mar 80 p 7

[Article: "Nearly 5,000 March To Oppose Nuclear Power"]

[Text] "My Only Hope Against Nuclear Power Is--Life!" was one of the proclamations seen in a colorful demonstration of marchers opposing nuclear power on 15 March in Helsinki.

The demonstration consisted of about 5,000 persons, which thus far was the largest in Finland on an environmental theme. Recommended were "wood, wind, and solar" energy to replace the planned 1,000 megawatt nuclear powerplant and the demonstrators wished also to lend support to the arousing of the public in anticipation of the nuclear vote in Sweden.

The numerous cardboard and cloth sun replicas and motled placards paled in the March sunshine which enticed hundreds of strollers to join the tail end of the procession that started from the Kisahalli sports building. Also, rag dolls, babies and larger children were well represented.

"Mankind, awaken before nuclear power makes that impossible!" exhorted the marchers. "Nuclear power brings nuclear weapons!" was another theme of fear because one nuclear powerplant produces about 200 kilograms of plutonium in a year while only 2 to 9 kilograms of it are needed to produce one atomic bomb. In addition, knowledge of nuclear technology, even for peaceful purposes, eases the construction of atom bombs.

The marches condemned Finland's intentions to participate in the construction of nuclear powerplants in such countries as Libya and Turkey, that openly envision having nuclear weapons, or who are not signatory to the antinuclear proliferation agreement.

The marchers from Kuopio stated that they can get along with energy from peat, while others favored the use of energy captured from the wind. Nuclear energy, in addition to "gobbling chromosomes" also "erodes democracy" alleged the marchers.

In addition to the participants from Helsinki, there were about 900 others from various parts of Finland. There were more than 110 from Oulunlaani, and three busloads from Kuopionlaani and Mikkelinlaani, emblems were seen from localities such as Muhos, Hikia, Lappeenranta, and the Riihimaki movement. The main doers behind the march were the EVY or energy policy associations as an alternative to nuclear energy, the Suomen Luonnonsuojeluliitto (Finland's Nature Protection League) and other nature organizations, political youth organizations, the Suomen Ylioppilaskuntien Liitto (League of Finland's Student Unions), the Sadankomitea (Committee of One Hundred), and two women's organizations who used the occasion to present the reminder: "No Women In the Army!"

Merja Salmi and Tiina Heikassalo were two girls from the Rauma rural commune. An invitation on the school bulletin board had brought them here, although neither are active in any organizations.

Young people in school currently talk a great deal about nuclear energy, and arguments easily arise pro and con. These girls feel that the nearness of the Olkiluoto powerplant does not have much effect on the attitudes of the people because "the majority of them are not much concerned about what goes on around them". However, they expect unbiased information from the news media as a countermeasure to the promotional literature put out by the power plants. "Just to make sure," was the political philosophy of these two people in regard to nuclear energy.

A person named Njassa stood out from a crowd of students, persons from Koijarvi, and others. He said he is not "in attune with the types" that now go to the Lepakkoluola to listen to familiar bands. His favorite slogan was, "An end to show-off -- Bring thrift back to honor!" He hoped also that the motley crowd at the station would gain sense to begin frequenting the Lepakko.

Olli Tammilehto, chairman of the EVY, said that the political parties in Sweden had attempted to arouse the power of their own forces that oppose nuclear power, but had found that this power resides among the activists at the basic level. But, according to him, even the rigid and submissive Finnish national character is now beginning to become aroused, as demonstrated by the success of this march.

"It is completely possible by saving energy, and by a brief transitional period of partial reliance on coal and peat, to shift to the use of purely safe and self-renewing sources of energy," according to Tammilehto.

The demonstration ended in street dancing to the rhythm of "country-music."

5900
CSO: 5100

LOVIISA POPULATION INCREASINGLY UNEASY OVER N-PLANTS

Helsinki HELSINGIN SANOMAT in Finnish 16 Mar 80 p 26

[Article by Risto Valkeapaa: "Nuclear Power Confuses Loviisa"]

[Text] Residents of Loviisa who have become accustomed to nuclear power over the years were suddenly awakened to the fact that the minimally active wastes are to remain in local base rock disposal sites for 500 years. The phrase "Thank Not Nuclear Power" is seen on the lapels of many people.

According to the Imatran Voima Oy power generating firm, the Loviisa II nuclear generating plant, which is 2 years behind completion schedule, is now to be subjected to final fatigue tests. Charging of the plant can begin in April, according to the power firm.

Although Phase I of the Loviisa nuclear generating plant was beset by delays and Phase II is not yet charged, the City of Loviisa already derives one fifth of its tax revenue from Imatran Voimy Oy. This figure is due to rise to 30 percent with the completion of Loviisa II.

Nontheless, Loviisa residents who for years have been accustomed to the idea of nuclear power are now talking about confusion. The problems of waste disposal turned out not to be as minimal as had been supposed. Even those wastes that had been considered minimally active require storage for 500 years. And the plan is to store them in Hastholmen.

At the same time negotiations are underway about the suitability of a new 1,000 megawatt nuclear plant. The site has already been selected in Loviisa.

Margit Willner is weaving a rag rug under roof timbers that are two hundred years old. The wooden loom, perhaps 150 years old, shows signs of decay. A small yellow sign hangs on the wall of this islander cottage. It tells what to do in the event of an alarm at the nuclear plant. A digital clock on the color television set shows 11:45. The date is 11 March 1980.

A week ago an item in the HELSINGIN SANOMAT had stated that radioactive wastes that will not become harmless until 500 years hence are planned for storage on Hastholmen, an island neighboring that of the Willner home.

The Imatran Voima Oy, which bears the responsibility for the wastes, states that the Loviisa residents gave their approval of the waste storage when they approved the charting of the area for nuclear power and related activities.

And of what significance can 500 years be when, as far as present-day mankind is concerned, Hastholmen island is already forever dedicated to nuclear energy? When nuclear plants have already been built in an area, then it is worthwhile to keep building them in the future as well.

Although provision has been made for the dismantling of the nuclear plants--one penni per kilowatthour is being collected for the purpose--it is a foregone conclusion that at least the internally radiating reactor structures will be saved for hundreds of years. Nor have dismantlers ever in the past been a threat to truly old structures in Finland, a country with an alert department of museums.

With its circular reactor structures Hastholmen will rise from the sea in the future as a memorial to its times, just as Olavinlinna castle today.

It Began From One Telephone Call

The history of the nuclear plant in the Loviisa area is not yet very long. Former Loviisa mayor Karl Gunnar Wahlstrom (Swedish Peoples Party) remembers the month of February 14 years ago when there was much more snow than now. He had then read the newspaper that the Kirkkonummi community did not wish to have the Imatran Voima Oy powerplant in its area.

Wahlstrom picked up the telephone, dialed the Imatran Voima Oy number, and asked the operator who it might be there that is buying land for such a purpose. That is how it began, says Wahlstrom.

He will go down in history as the man who offered a plot of land to the first nuclear powerplant in Finland.

Today he says that he was fully aware at that time of the long-reaching effects of the proposition, both nationally and locally.

The Loviisa 440 megawatt No 1 Unit has now been in operation for over 2 years. The experience with it thus far has been almost entirely favorable.

The Loviisa No 2 Unit of the same capacity is currently underoing fatigue testing. This is to be the final test for determining the fitness of this facility, the completion of which is two years behind schedule.

After Loviisa II goes into operation it should be able to produce electricity for 20 years. After that the facility will have produced so much electricity that it will not matter if production should stop.

An agreement is also due for conclusion during the first half of 1980 for a study concerning the practicability of a 1,000 megawatt nuclear plant. Imatran Voimy Oy and Atomenergoexport, the Soviet participant, are currently preparing the agreement. A nuclear plant of that capacity can be built, according to a present land survey, on the south part of Hastholmen island.

Confusion Bothers Loviisa

Loviisa residents now have everything that they envisioned in the mid-1960's. The city now has big industry which has produced secondary industry, and Imatran Voima Oy provides one fifth of the city tax revenue. Nontheless, decision makers in Loviisa are beset by confusion.

Engineer Eero Laakso, (Coalition Party), an authorized official of the City of Loviisa, and who is also a deputy chairman of the Ita-Uusimaa nature and environment protection association, voices the sentiments thusly, "I am confused by confrontation with immense issues. The issues have begun to sway men, not men the issues."

Laakso is not adversely inclined about nuclear energy. However, knowledge of the opposition to it has confused him greatly. The assumption throughout the 1980's was that the wastes were not a Loviisa problem, that they were to be disposed of in the Soviet Union.

At that time the wastes were conceived as consisting of uniformly highly active fuel wastes. It has now been agreed that they will be taken to the Soviet Union after a storage period of 5 years. The storage period was originally agreed at 3 years.

As recently as 3 March 1980 when the Imatran Voima Oy request for permission to conduct seismic measurements on the Hastholmen area was being considered by the city council the agenda mentioned such items as "minimally active wastes, tools, clothing, filters, and the like." These were intended to apply to medium and low level active wastes. It was not known then that the storage period even for these is fully 500 years.

The city council granted the permission to conduct seismic measurements, which are used in determining the suitability of the base rock for the storage of the wastes. The rough preliminary findings support the assumption that the wastes can actually be stored at Loviisa.

Former mayor Wahlstrom interprets the granting of the permission as an adoption also of the principle that the wastes may be stored in Loviisa. "The requisite for that is, of course, that the base rock proves to be suitable." Current mayor Sigurd Slatis (Swedish Peoples Party) says that the request involves merely the granting of permission to conduct measurements, not storage. Eero Laakso in turn maintains that in matters such as this the views of the Loviisa decision makers must without fail be heard.

Crisis Training Confirms a Viewpoint

Elmar Badermann, a licentiate of technology, wears a yellow button on his lapel with a message similar to that on the wall of the Willner cottage. He is one who has learned to express his views forthrightly.

Baderman is now an opponent of nuclear power of 2 years' duration. His viewpoint became firm at the time when the city officials were being trained on the action to take in an emergency situation.

"We must ride in an automobile into the contaminated area, while constantly measuring the amount of radiation. When it reaches the level at which it is harmful to humans we can turn back. The thought then struck me during the training that there is something rotten here," says Badermann.

This impression became confirmed while spending the last two summers at a summer cottage on an island that neighbors the nuclear plant island. "There have been two false alarms at the nuclear plant during that time. According to the instructions, when an alarm is heard one must go indoors and listen to the radio on an ultrashort wave channel.

"On the first occasion it was not until the following day that I learned from the local newspaper that it had been a false alarm. On the second occasion the false alarm was reported 3 hours later on the radio," said Badermann.

City Economy Dependent on Nuclear Energy

"The supporting of nuclear energy requires faith in the experts," says Mayor Slatis. "Even if an ordinary person had all the possible information about nuclear energy, he would be unable to assimilate it in such a way as to make his own decisions on that basis, because even the views of the experts may be in conflict."

"The question is not one of technology, but rather, a sociological one. The extent to which nuclear power is to become a decisive factor can be resolved also by ordinary people," says Badermann.

Badermann points also to the degree of dependency of the city on Imatran Voima Oy. The city derives one fifth of its tax revenue from that power firm. Should a disruption lasting a year occur at the plant, the city finances would be in chaos.

The city finances are already strained because of the delay in the completion of Phase II. The revenues accruing from that source have been taken into consideration in the drafting of long-range city plans and the delay is causing pressure for an increase in the rate of private taxation.

Wahlstrom sees the positive effects of the nuclear plant as greater than the negative effects. He well remembers the concern of Loviisa residents at one point whether or not the plant was to be built in Loviisa, although the land negotiations for the site had already been concluded. "The construction of a sewer system was begun with the 1.1 million markkas already received from Imatran Voima Oy. The project was completed at a cost of four million markkas in anticipation of additional revenues from the powerplant."

Opposition Raises Its Head

Strange things were done during the last half of the 1960's as employment projects, while waiting for the construction of the powerplant. "Such things as a pleasant highway approach to Loviisa were built. Also, a right-of-way for a highway to by-pass Loviisa was cleared, but the highway was never built," said the former mayor.

The sentiment opposing nuclear power has been increasing during the passing years.

City council chairman Lars Pelin summarizes the situation thusly: "At first, the idea of nuclear power was unanimously approved. The Loviisa II powerplant came as a surprise and many then said that a second one was not needed, but there was no further opposition to it. Then in 1974 the council adopted the stand that Phase II, which involves the third and fourth units, would not be put into use until sufficient experience had been gained from the first and second units."

Nuclear energy has not yet however become a clearly delineated communal issue in Loviisa. The opposing views have been of an individual nature. According to Wahlstrom, supporters can be found among both the enterprisers and the workers.

The Loviisa city council has a bourgeois majority of 19 to 16. The leftists consist of 12 social democrats and four communists. The leftists have supported the powerplant mainly because of the need for employment. Chairman Viljo Tolsa of the social democratic group says that he unequivocally continues to support nuclear power.

The rightists in the council consist of 13 Swedish peoples, four coalitionists, one Christian people's, and one liberal party members. Only a possible vote in the council could clarify the overall situation, but there are outright opponents of nuclear power at least in the Swedish Peoples Party group.

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CSO: 5100

SUNDQUIST: DECISION ON NUCLEAR POWERPLANT 2 YEARS AWAY

Helsinki HELSINGIN SANOMAT in Finnish 16 Mar 80 p 26

[Text] According to Ulf Sundqvist (Social Democrat), Minister of Trade and Industry, the decision to construct a new 1000-megawatt atom power establishment need not be reached until perhaps 2 years from now. In answer to a question put to him by Veikko Vennamo (Finnish Rural Party) at the questioning period in the parliament, Sundqvist stressed the fact that the investigative work currently underway does not mean that a decision has already been made in favor of nuclear power.

Sundqvist said that the investigation of alternate energy policies currently in progress should be continued in Finland without in any way becoming committed to any political decision for the expansion of nuclear energy use.

According to the minister, the new atom energy legislation will come before parliament before the need to make the decision regarding a possible new atom energy establishment. That way the parliament will have an opportunity to delineate the use of nuclear power.

On 13 March opponnets of nuclear power visited in parliament to talk with the various parliamentary groups. This delegation representing various organizations was concerned whether in fact the preliminary studies concerning the 1000-megawatt Soviet nuclear power establishment might mean that agreement for its procurement had already been reached.

The prpresentatives of all the parliamentary groups ave assurrances that this was not the case. The studies do not indicate that the establishment will necessarily be procured. The representatives of the parliamentary groups agreed to the viewpoint of the delegation in that the parliament must have the power in the future to make the decisions regarding the procurement of nuclear power establishments.

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CSO: 5100

FINLAND

NUCLEAR POWER FIRM ENGINEER ANSWERS NUCLEAR WASTE CHARGES

Helsinki HELSINGIN SANOMAT in Finnish 20 Mar 80 p 13

[Letter to editor captioned: "Imatran Voima Oy: Nuclear Wastes Safely Into the Base Rock"]

[Text] Architect Elmer Badermann presented some questions in the reader opinion page of the 13 March 1980 issue of HELSINGIN SANOMAT regarding medium active nuclear wastes, along with some comments arising from the HELSINGIN SANOMAT interview with the undersigned published on 5 March. The interview took place at the outset of the field studies of the possibilities of storing the Loviisa powerplant medium and low level active wastes in base rock. The problems involved in the Loviisa wastes was discussed at length also in a lengthy HELSINGIN SANOMAT article on 16 March.

I will answer Badermann's questions somewhat later because I would first like to present some facts that may help to clarify the matter.

The medium and low level active wastes, or so-called powerplant waste, are created during the powerplant operation from all materials that have come into contact with active powerplant water or gases, such as those found in the filters and in protective clothing.

Wastes such as these are considered to be radioactive in the "medium" level. For instance, when compared to highly active waste or to used fuel, the relative amount of danger that it presents is less than one millionth at a powerplant even if the fuel leak should be abnormally large and much radiation thus existed in the processes within the plant.

In addition, the amount of radioactivity contained in the powerplant wastes decreases notably more rapidly than the radioactivity in highly active waste or in used fuel. However, the amount of radioactivity contained in these wastes decreases to the level found in ordinary substances only after several hundred years.

That being the case, such wastes are normally isolated from the sphere of activity of humans. A great amount of experience has been had with such measures in countries other than Finland. Wastes have been placed into salt mines, ocean depths, and in terrestrial formations. The best solution in Finland is placement into base rock.

The basic consideration in final disposal is that when the disposal site is closed it will not require any maintenance and, in particular, that it will not in any phase be a threat to the environment. The extent of the safety measures, for instance the depth of final disposal, is determined by the amount of harmful radioactivity in the wastes.

The important issue therefore is not how the harmful and long-term wastes are to be disposed of but what the final result will be and how safe the final disposal is to be made. The safety of the final disposal is thoroughly evaluated during the process of site determination by the appropriate officials.

This of course will be the procedure at Loviisa as well. However, it ought to be noted already at this stage that the low level of radioactivity of this type of waste does not require very deep burial nor need the quality of the base rock be particularly high in order to assure adequate safety. Elsewhere throughout the world neither the powerplant wastes nor their disposal are at all considered to be a problem.

"Is medium-level radioactive nuclear waste harmful?" And, "Is 500 years a long time?" asks Badermann. The proper answer to both questions is of course "Yes".

However, it is quite easy to detect the questioner's transparent attempt to obtain an unfavorable answer in respect to the matter about the waste and to evade the actual facts.

During the course of the years we have become accustomed to questions such as, "Can a nuclear powerplant accident take place?" And, "Can radiation casue cancer?" But what point can there be to answer questions with such self-evident answers?

Issues are not resolved on the basis of answers to questions such as these.

The basis for the resolution of problems must be arrived at through thoroughgoing investigation. The question to be asked must be how great is the risk of a nuclear powerplant accident? And, how great is the radiation threat [illegible]g from the final disposal of the waste?

[illegible] give an answer based on extensive numerical values to the question concerning the final disposal of the powerplant wastes, but perhaps the matter may become sufficiently clear with a brief statement that, regardless of the fact that medium level radioactive wastes are harmful and that 500 years is a long time, the final disposition of wastes in this case fully satisfies the environmental radiation safety requirements. Were it otherwise, this final disposition would not even be under consideration.

I wish once again to stress the fact that the "needed storage periods" must be correctly comprehended. As already pointed out, the final disposition is made in such a way that the wastes will not require any maintenance nor present any threat to the environment. Once the final disposition has been carried out the wastes will forever be out of our sphere of activities.

There is need to make two comments about the rest of Badermann's expressed point of view.

I do not know what Badermann meant by the reference to the permanent storage of high-level radioactive waste and to the Hastholmen studies, but for the sake of clarity I want to state that there is no need nor intention to store the wastes at Loviisa.

The newsppaer article to which Badermann referred dealt only very briefly in a general way about the significance of the plot map in regard to the waste problem, for which reason I wish to add only slightly to the matter, especially since Badermann interpreted the reference in a fairly straightforward way.

The plot map delineates the needed land use requirements for the carrying out of the powerplant waste disposal. In addition, the establishing of a final disposal site naturally requires that several permits be obtained from communal and state officials. This being the case, it is clear that contact must be maintained with the commune in the future in regard to the matter of the waste.

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FRANCE

PEASANTS RESISTING WAVE OF URANIUM PROSPECTORS

Paris LE MONDE DIMANCHE in French 6 Jul 80 pp IV, V

[Article by Richard Clavaud: "Resistance: Uranium Rush"]

[Text] France has uranium fever. There is prospecting, digging. But, from the Ambazac mountains to the hills of Herault, the peasants are resisting.

Uranium fever has taken hold of France. From now until 1985, the needs of the French nuclear program will double, and will amount to 7,500 tons, almost half of which will be extracted in France. Requests for prospecting permits have been officially granted for 15,000 square kilometers.

This past 15 April, the JOURNAL OFFICIEL mentioned no less than six requests for permits, to cover about 565 square kilometers. This rush for uranium is explained in part by the acceleration of the French nuclear program and by the considerable amount of capital invested in prospecting.

The foremost company that is exploiting national resources is the Cogema Company (General Company for nuclear material), a private enterprise branch of the AEC [Atomic Energy Commission]. Private companies are also interested in this ore: the Dong-Trieu Mining Company (Empain-Schneider group), the Minatome (Pechiney-Ugine-Kuhlman and the French Petroleum Company), the Industrial and Mining Company (Rhone-Poulenc), and the National Elf-Aquitaine Company. According to Electricite de France, metropolitan uranium production will probably amount to 2,850 tons this year.

While some fields have been exploited, or are being exploited, in the Vosges, Morvan, and Vendee, it is principally in the south and center of France that uranium is found: in the Massif Central, Rouergue, Languedoc, Provence, and Aquitaine, where a recent discovery increases French reserves by 20 percent (LE MONDE, 6-7 April and 29 May 1980).

Bitterness

For many Frenchmen uranium is not a novelty. Its extraction began in Limousin approximately in 1947. At that time, no one spoke of it and the mine was secretive. But now, as indicated in a communique of the Defense Committee of Saint-Sylvestre (Haute-Vienne), the situation has changed. "Through chance or bad luck Saint-Sylvestre became the heart of the mining region. Thirty years ago we were proud of this. Today we are bitter." From the farmers of Limousin to the wine growers of Lodevois (Herault) or to the Catalan truck gardeners, a resistance movement is developing and signs saying "No admittance to the Cogema Company," "No to the Minatome!" abound at the entrance to villages.

Since 1976, the wine growers of Saint-Jean-de-la-Blaquiere (Herault) have prohibited the technicians of the Cogema Company, whom they call the "new lords," from entering their village. In May 1979, some peasants demonstrated in front of the headquarters of the same company in Razes (Haute-Vienne) to the cries of "No to the demolition of our buildings," "No to colonization!" In August 1979, 70 persons from Perigord, led by their mayor, made the acquaintance of the people of Saint-Sylvestre. They came in order to ascertain the impact of the mines on this region. Together, and with the support of the "Occitan Volem Viure al Pais" movement, they published a "manifesto and an appeal to the inhabitants of the south." "In Saint-Sylvestre, a historical place where the first uranium prospecting was begun, we declared our resistance and union. We called on the people of the southern regions to unite, from Perigord to Mercantour, to impose the preservation of our rights and to decide our own future."

This past 25 February the farmers and the inhabitants of Vimenet (Aveyron) opposed the continuation of drilling that had been undertaken by the Central Company for Radioactive Ores and Metals (SCMMRA), a branch of Minatome. One could multiply the examples.

March 1980. In the small village of Octon, near Lodeve, the inhabitants of municipalities affected by a request for a permit to prospect uranium, met in the town hall. Wine growers for the most part, they came in family groups, to talk with their neighbors in Saint-Martin-du-Bosc, where mines had already been exploited. People from Saint-Jean-de-la-Blaquiere were there, too. Maurice Gely, a wine grower and vice president of the Association for Protection Against Harmful Effects, spoke: We in Saint-Jean have long said no to uranium. It is definite: we want nothing to do with mines or quarries. In the beginning, other villages said: 'In Saint-Jean, the people are complainers, blusterers.' But now that exploitation has begun, they admit: 'You were right.' Even the 'lukewarm persons' of the village ask us when we are going to again put up the placards that had been set up at the entrance to the village: 'No admittance to the Cogema Company!' and which some outside people took away."

Some new signs will be set up, bigger, more solid ones. "And if they are taken away," commented Maurice Gely, "others will be put up. In concrete!"

Why this obstinacy? Why did this wine grower to whom the Cogema Company offered a 4,000 square foot vineyard in exchange for a 2,000 square foot one refuse the exchange? It is because the land has required too much of an effort to let it die. Thanks to improved vine plants, the region produces quality wine, classified as VDQS (superior wine). If the mines expand, what will become of these wine growers and these cooperatives? Protect the agricultural lands: this peasant demand is found again in the slogan of the people of Aveyron--"Yes to pastures; no to drillings,"--or in that of the peasants of Limousin who are worried over the great purchases made by the Cogema Company, which has become one of the biggest land owners of the region.

When one begins to speak of the impact of the mines on the environment, the "complainers" are very serious and very well documented people. As one of them said: "Even though we left school at the age of 12 to work, we nevertheless know how to become informed on our own--because the mining companies are not the ones that will do it for us!" They then produce scientific reports from the chests inherited from their grand parents and explain why they say no to uranium.

Even though the upheaval of the landscape in the case of strip mining has taken on great proportions (the quarries of Limousin are the most considerable in Europe) those who are rebelling are fighting against some less directly visible risks. First, the mining blasts. Before attacking the ore with a steam shovel, it is necessary to break up the beds with an explosive. The more one uses, the more the layers break up. "One day, 20 tons were fired at one time. A little too much had been used," commented a miner from Lodeve. And when one uses "a little too much" the walls of the farmhouses crack, as in the case of the municipality of Saint-Sylvestre (Haute-Vienne) or the Alary farmhouse.

It must be admitted that the mining companies take certain precautions with respect to the people. A family in Limousin was advised to leave their house at blasting time, that is, at 0700 hours. At the Alary farmhouse, the last two inhabitants of the village, Mr and Mrs Daumas, have long been advised to open doors and windows during blasts in order to avoid the window panes from yielding to the blasts. "In the winter," said Marthe Daumas, "it is worrisome; the cold comes in. Ah, those mine balsts, how I have deplored them! And the water; one can no longer use it." It was the water that was collected in tanks when it rained.

Worried

Today the inhabitants fear that it is contaminated by the discharge of the radon gas that comes from the disintegration of uranium ore. This rare gas that is located in the geological layers is released at the time of the exploitation of the ore and of its stockpiling. It also escapes from the ventilation ducts of the underground tunnels of the mines, some of which are located some tens of meters from homes and even in some farmyards in Limousin. According to the mining companies, there is no danger. However, those who live near the mines are becoming increasingly anxious. "Why do they not tell us what amount of radon concentration is in the air of our villages?" asked the wine growers of Lodevois[1].

Well, one still does not know the effects of radon and of the other compounds that are released when the ore is exploited. In its 1979 fourth quarter report of activities, the Central Office for Protection Against Ionized Radiation (SCIPRI)[2] acknowledges that "the mechanism of biological action form radiation is still far from being clear, and only perfectly reproducible numerous results from systematic measurements, over sufficient periods of time, can constitute the basis for serious research, especially with respect to the long-term biological action of the weak doses of radiation and of the radioactive contamination of the environment." At the Alary farmhouse, Marius Daumas remembers the recommendations of the administrators of the Cogema Company. "They told me not to drink the water from the tanks, because it could make us sick." But it is impossible not to breathe the air from the quarry, just a few hundred meters away.

But Mr and Mrs Daumas no longer feel like fighting against that quarry that consumes the mountain and their village. The fight is too unequal. They know that the Alary farmhouse is doomed and that all that is left for them is to leave. "If it were not for that quarry, we would have stayed. "But with those blasts, that dust, life has become impossible. You know, one cannot believe that this is very good for one's health. Our young children are the ones who will pay for that." Before the departure, Daumas served the traditional walnut wine to the visitor. A security guard for the mining site, who stopped by to say hello, was also included in the round of drinks. Here one is not spiteful and the guard at the mine has replaced the mailman. Seated before the fireplace, where the date of the building, 1682, appears, he suddenly took his walkie-talkie and went into his "Uragamma here; can you hear me?..." Soon there no longer will be a vineyard from which to make walnut wine and no more inhabitants to celebrate the 300th year of the village.

The water problem is often at the center of the worry of the people who are affected by the uranium mines. In most of the municipalities where a mining company is installed, springs disappear. In Lodevois there were several cases in the vicinity of Saint-Martin-du-Bosc. The same for Haute-Vienne. "They do propose to compensate us through insurance," commented a peasant from Saint-Sylvestre, "But we do not want money. We want our springs!" The liabilities have led to very hard struggles in this region of the Ambazac mountains, especially in Grandmont, where the population recently blocked roads in order to prevent the Cogema Company from continuing a drilling project. The project was resumed only after the intervention of the CRS [State Mobile Police], while an alarm bell rang in the bell tower for 10 hours ...For the first time in France a uranium prospecting mining company (The Cogema Company) worked under the protection of the forces of order. But in the village—in the midst of the pennants, "Where the Cogema Company goes through, the streams disappear," "No to colonization; we will preserve the land"—the faces were serious. As he drove his automobile through the CRS cordon, Maurice Couturier, deputy mayor, had tears in his eyes. Here no one has forgotten the war years and the tradition of resistance of the Ambazac mountains. The defense committee of the inhabitants of Saint-Sylvestre recalled this in a communique that was published this past 24 April: "As in 1943 when the maquis of Grandmont resisted the occupation, a new resistance opposes a new occupant, the Cogema Company....Our fight for the life of the land is only just beginning. It will spread to other groups and to other places."

Excess

Another worrisome matter for the people who live near the mining sites: the liquid waste from the mines and the factories for the concentration of ores. These factories are located in each mining division, because the average assay value of the ores is slight, from 0.1 to 0.3 percent. Thanks to a mechanical chemical treatment, a product with an assay value close to 70 percent is attained--yello cake--the form in which commercial transactions of uranium are made. The problem of water pollution is most acute in Limoges. For 30 years the effluents from the mines of the Ambazac mountains have been discharged into the ponds that provide Limoges with drinking water.

In 1966, the ministry of health remarked that "the result of a check indicates that the standards or rules of safety now in effect have been exceeded; but, in the opinion of the administrators of the SCPRI, this excess is not harmful to public health."

The results of radioactivity measurements were kept secret until 1979, when some scientists "borrowed" the SCPRI reports and published them. Then they became public, but the classification of water into categories underwent some changes and the reading of the results is more complicated. Some precautions were taken by the Cogema Company to decrease the proportion of radioactivity in the waste, and the present standards evolved. The radium amount not to be exceeded is now 10 pico Curie points per liter, whereas the World Health Organization (WHO) standard is 3 pico Curie points per liter.

In order to guarantee the independence of persons charged with taking the measurements, the municipality of Limoges decided to set up a control service that is independent of the SCPRI, with the help of a specialized laboratory of the University of Paris-Sud (Orsay). The matter of barium, used in the re-treatment of water before being thrown into a stream, was also to be ascertained. In spite of the supposedly reassuring precautions and statistics, there is still anxiety. In October 1979, at the time of the ministry of environment's Scientific and Technical Days On Water, Louis Longequeue, mayor of Limoges, concluded: "It is not only necessary to lessen a risk; it is necessary to prevent any risk, even if there is only 1 chance of a risk in 10 million. If there is a risk of pollution from a discharge of any toxic products whatsoever during the exploitation stage of mines, we must prevent it; and I think that in order to prevent it, there is only one solution: no discharge into the reservoirs." A network of pipes is currently being studied to cause wastes to go downstream from the town's water reservoirs. The matter of the Limoges water has not yet been definitively settled.

These require a significant technical research effort. But the administrators of the mining companies are worried above all from the economic point of view. With respect to what affects the workers of the mines and the wastes in the effluents, the interministerial group for the evaluation of the environment acknowledged in its report of December 1973 that "if the standards...were lowered, especially after the pressure of public opinion, technical changes would have to be applied...This would result in an increase in production costs that are difficult to calculate, but which could compromise the activity of some French exploitations." The AEC indicates in its information notes of June 1978 that from now until the year 2,000 the increase in uranium production costs will come from the evolution of labor costs and "costs due to the preservation of the environment and in particular to the level of wastes from concentration factories."

The matter of the standards in effect is posed also for the control of the amount of radon in the atmosphere from the mines and their environment. French standards are 10 times less restrictive than those established by the International Commission for Radiological Protection (CIPR). If this standard were honored, only 20 percent of the world reserves of uranium would be exploitable for technical reasons (difficulties with respect to the containment of radon) and for economic reasons, in view of the production cost that that would entail. In the present status of legislation, the matter risks remaining without an answer.

Stockpiling

Emanations from radioactive products are also the topic of a juridical discussion involving the population, elected officials, and representatives of the mining companies, with respect to the classification of factories for the concentration of ores. During a discussion that included the elected officials of Lodevois, representatives of the Association for Protection Against Harmful Effects of Saint-Martin-du-Bosc and the directors of the Cogema Company, the matter was dealt with in the open. Is a concentration factory merely a building as such or a basic nuclear installation (INB)? In the opinion of the elected officials, if one were to take into account the stockpiling of ore and that of the wastes after processing, one would arrive at a radiation ratio that would require these installations to be classified as INB. That would make possible a better control of gaseous wastes, of liquid effluents, and the containment of wastes. The present classification would thus be illegal. According to the Cogema Company, on the other hand, "the factory in itself does not represent any radioactive danger...If there is any radioactivity from radon emanations, it would not be any more significant than that released, for example, in the granitic regions."

The local authorities also wonder about the future of the mining sites after exploitation. What should be done with the quarries and the buildings? It would be very unlikely that they would be returned to agricultural use, as did occur in Guerande (Loire-Atlantique), where, on this past 14 April, the peasants symbolically worked a "recovered agricultural area" after 3 years of mining exploitation. Questioned on this matter, Clovis Caleix, director of the mining division of Lodevois, is optimistic: "We will reconstitute the site, even though no law obliges us to do so. That will be done in the form of a lake or reforestation. The concentration factory will be completely dismounted. The other buildings, built in the style of the town, could very well be utilized again, for vacation camps, for example..."

For the moment, the abandoned quarries seem destined to another function, the site for the stockpiling of radioactive wastes. That plan, envisaged in Saint-Priest-La-Prague, casued a demonstration last 24 May (LE MONDE, 27 February and 30-31 March 1980). In the Haute-Vienne, the Brugeaud quarry has been used since 1974, to stockpile the wastes from the factory for the concentration of the rich ores of Brouchet, in the Paris region. Radioactive mud and small contaminated metal girders, after having travelled over more than 400 kilometers of readway, were buried in that quarry.

In October 1978, the Association For the Protection of the Ambazac Mountains undertook an expert evaluation, within the framework of a judicial action against the Cogema Company. That study showed an average yield of six millirads per hour, whereas the proportion established for the mine workers is 0.5 millirads per hour. And yet for some years some ornithological teams from Limoges were authorized by the Cogema Company to camp and to put bands on birds on this site, in the company of children. Even if the length of exposure for miners is shorter, is there not a risk?

Middle Course

In the face of these problems, the local elected officials try to protect their administrations, while remaining loyal to the national choices of their parties. Following a middle course between the resources of the soil and those of the subsoil is a delicate task. In a village of the Pyrenees-Orientales that is affected by a request for a prospecting permit from the Minatome Company, the inhabitants are worried about their communist mayor who, while defending them, has the formidable mission of reconciling "the nuclear yes" of the PC [Communist Party] with the "Minatome no" (outside, in Catalan): "Poor thing, he no longer sleeps because of this," commented one of his employees.

In this region where the agricultural land exceeds 20,000 F per hectare, the economy depends completely on truck gardening, which requires great quantities of water. The experience of Limousin or of Lodevois worries the departmental authorities who, in 1977, declared their desire to protect that water: "The department will oppose any initiative that could pollute or disturb the underground layer of water." In January 1979, the Herault town council passed a motion to condemn the open-air quarries and it "resolutely opposes all enterprises that more or less admittedly would imply the disappearance after a certain amount of time of the villages concerned. Bernard Alibert, socialist municipal councillor of Herault, is worried about the consequences of the activity of the Cogema Company on the enrivonment and about the lack of information: "Several times we have requested that we be informed of the results of the measurements of the quality of the water and of the air, but without success. The same for requests for information on fatal accidents that occurred in the mines in June 1978 and this past January." On 29 May 1980, the Departmental Sanitation Committee met to discuss the matter of water pollution from the mines. The elected officials of the sector were not invited...They protested this brush-off to the then prefect, Maurice Lambert.

A Good Transaction

Contrary to this, in Limousin the town councillor and socialist mayor of Ambazac, Andre Gagnadre--who is also a geological engineer at the Cogema Company, where he has worked for 26 years-- is optimistic: "The mines and the quarries do not constitute a danger. Just the opposite. The region benefits a great deal from the activities of the Cogema Company..." (see LE MONDE, 24-25 June 1979: "Uranium Will No Longer Enrich").

It is true that some sectors of activity have based their hopes on the extraction of the ore. In the Bessines (Haute-Vienne) region it is glorified with signs: "Uranium Restaurant," "Uranium Service Station." Along National Highway 20 one can always see trucks full of ore stopping in parking lots at meal time. On the other hand, the mayor of Bessines is more skeptical. In June 1979, he said to the town council of Haute-Vienne: "Uranium does not bring any revenue to the municipalities or to the department. On the contrary, it adds to the cost of roads." In fact, the mining companies pay 1 franc per kilo of extracted uranium, which is sold for more than 400 francs to the EDF [French Electric Company]. That does not prevent Daniel Mallet, radical mayor of Lodeve, from being very optimistic regarding the economic impact of the uranium mines on the department: "For us, it is a good transaction, especially in this region that is in difficulty. Furthermore, we are quite far from the site of the exploitation itself, and it will not do us any harm."

Relations between the elected officials and the population sometimes go through periods of crisis, especially when tension increases between these two parties and the mining companies. The balance between political choices and local action is more difficult to maintain. The case of the village of Grandmont is an example of this. At the end of the first day of the roadblock this past 24 March, the communist mayor, Albert Petavy, and his first deputy, who had supported the action up to that day, decided to give up this type of contestation. They preferred to await a reply from the administration to a request for an interview. The inhabitants of the village were the only ones to greet the police who came to dismantle the roadblock. That morning the mayor stayed home, refusing to make any statement. His party supported him in the local newspaper, ECHO DU CENTRE, which did not hesitate to print the headline: "Failure of a a politician-type operation" and condemned the "several persons" who "have lost all dignity, even to the point of going beyond the law." A new association has emerged from those weeks of struggle, the Association of the Grandmont Movement "for the source of life."[63] It proposes to continue the struggle until their claims are satisfied, with the assistance of a "reorganized defense committee," and insists on the necessity of union with the municipality.

To Live In The Town

Who are these people who are fighting against the harmful effects of the mines? In general, peasants. Their desire to resist is based on the choice that they have made to continue to live there where they are--whether because they have decided to preserve family exploitation, or because they are recent settlers, having fled from the city. The ones who leave and abandon the land to the mining company are most often old persons for whom life has been made difficult. It is not the selling price of those lands that encourages them to leave their town. In Lodevois, the royal price of 50 centimes per square meter is paid. Those who do not leave are resisting and trying to save their lands. As in Larzac, the wine growers of Saint-Jean-de-la-Blaquiere have established a GFA (Agricultural Landed Group), which will make it possible for them to delay the mining company's procedures to occupy the land.

But employment is scarce in these regions where the mines have located. In the villages that depend on the vineyard, one gladly accepts any opportunity to find a more remunerative job. So the young people leave the land in which they no longer believe to go to the mine. What do the radon and the other risks matter? What matters is to be able to live with dignity--to be able to buy a new automobile and to carouse in the village cafe upon returning from a rugby game. Those miners speak little of their work. For that there is the trade union. Their basic salary is the same as that of the SMIC [Interoccupational Minimum Growth Wage], and it is thanks to the bonuses that they succeed in living comfortably. These bonuses are earned chiefly by those who work at the bottom of the mines. The trade unions are fighting for salaries, against the ever-increasing amount obtained by the sub-contractors, and for the extension of exploitation. So peasants and workers who sometimes live in the same villages, or under the same roof, avoid speaking of the mine.

Even though they are not "antinuclear," the peasants who are fighting against the impact of the mines receive the support of the local ecological movements, which are trying to pass on some ideas on renewable energy and the development of an alternative.

Isolated a few years ago, they now are well organized. They visit each other, from one department to the other, and make inquiries. Those from the Pyrenees-Orientales or the Vosges visit those in Haute-Vienne; those from Lodeve go to Aveyron; and one can foresee that the wine growers of Gironde will go to see their fellow countrymen in Saint-Jean-de-la-Blaquiere. The "mobilization" is becoming international: a European meeting is scheduled for 4-6 July in Bessines (Haute-Vienne).

All of these peasants live from the land--not from uranium. If this land is ripped open by steam shovels, dried out as a consequence of drilling; if the villages disappear; what will they have? They do not want to be the ones to pay for "France's independence with respect to energy."

FOOTNOTES

1. The radon that comes from uranium is insoluble in water. It nevertheless can be held in suspension in small quantity. Its life span is slight: it loses 50 percent of its radioactivity in 3.82 days. One does not yet know how to "trap" radon and to confine it during the time it requires to lose its harmfulness.

2. SCPRI, B.P. 35, 78110, Le Vesinet. Tel. 976-02-72.

3. Contact: Andre Christophe, Grandmont, Saint-Sylvestre, 87240 Ambazac.

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NETHERLANDS

BRIEFS

MAJORITY AGAINST NUCLEAR ENERGY--Over half percent of the Dutch population opposes nuclear energy, according to a public opinion poll published by the TROS broadcasting corporation last night. The survey, held by the Info-Phone BV market research bureau among 503 people over 17, showed 53 percent against, 22 percent for and 20 percent no opinion. Five percent said it depended on the way nuclear energy is used. [Text] [The Hague ALGEMEEN NEDERLANDS PERSBUREAU in English 5 Jul 80 p 5]

CSO: 5100

SWEDEN

AUTHORITIES GIVE TENTATIVE GO-AHEAD TO N-WARM WATER UNIT

Stockholm DAGENS NYHETER in Swedish 20 Jun 80 p 5

[Article by Borje Karlsson, journalist: "Stockholm Metropolitan Area To Be Heated from Warm Water in the 90's. Go-Ahead for Tunnel from Forsmark"]

[Text] The houses in the Stockholm Metropolitan Area are to be heated by warm water from Forsmark in the 90's. This is now tentatively decided by the politicians. As a consequence, it would seem as if the plans regarding coal-powered heating plants in Vartan, Lovsta and Augustendal could be scrapped. But tough negotiations with the State Power Board and with the Ministry of Industry still remain.

The Board of the Stockholm Metropolitan Energy Corporation (Stoseb) last Thursday accepted the Forsmark tunnel. Fifteen municipalities in the County of Stockholm are affiliated to the Stoseb.

The warm water tunnel is to be built from the third reactor plant in Forsmark, which will be ready in the fall of 1985, to the district heating plant in Akalla in northern Stockholm. In a parallel tunnel the water will flow back to Forsmark. The tunnels will cover a distance of 120 km.

The water will be heated by steam, reaching 120 to 130 centigrades in Forsmark. It will be around 70 centigrades when it leaves the plant in Akalla.

"The Alternative Is a Coal Orgy"

The cost of the completed projedt will amount to approximately 5 billion kroner. If the government and the parliament give the go-ahead the tunnel could be ready some time in the late 80's.

"The tunnel must be included in the Government's Bill on Energy Policy to be presented in January," says Carl Cederschiold (of the Conservative Party), Commissioner of Stockholm. Cederschiold is the chairman of the Stoseb.

"Many questions must be examined before we can start using the spade," he says. Tough negotiations remain, i.e. relating to the cost-sharing.

"The alternative of the Forsmark tunnel is a coal orgy," says Cederschiold. If we are to get rid of the dependence on oil there is no other option. Solar power would require billion-crown-investments to give any noticeable heating effects and, furthermore, enormous areas must be reserved to collect and to store the heat from the sun. Even the people of the Center Party in Stockholm are beginning to understand this.

The heat from Forsmark equals 1.5 million tons of coal annually, informs Cederschiold. If the tunnel is built we will avoid the planned coal-based heating plants in Vartan, Lovsta and Augustendal in Nacka.

The coal-powered heating plant in Fittja will have to be built anyway. It is needed as a reserve plant and for heating the municipalities in the southern part of the region, primarily Sodertalje.

It is wrong to state that we now will be tied to nuclear power for the infinite future, says Carl Cederschiold. When nuclear power is discontinued sometime early in the 21st Century Forsmark could be powered by some alternative fuel and the tunnel could continue to be used. Otherwise we would have to build new heating plants in the center of the city.

All politicians of the board of the S'oseb support the decision, including those representing the Center Party. At this stage they have no objections. The final decisions will not be taken until the fall when the Energy Policy Bill will be finalized.

The State Power Board Has Some Objections

On the Other hand, the State Power Board already has some objections to the Forsmark project. Those relate to technical as well as economic issues. Forsmark III will have to be equipped with counter-pressure turbines and heat exchangers to produce warm water. As a consequence the production of electricity from the reactor will be reduced.

"We must ask ourselves if it is reasonable to reduce the production of inexpensive electricity to produce warm water instead," says Bo Eriksson in the State Power Board's Information Department. Presently an investigation is being performed in the institution. The investigation will also examine if it is possible to supply Gothenburg with warm water from Ringhals.

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SWEDEN

RADIATION PROTECTION INSTITUTE WARNS OF MANPOWER CUT EFFECT

Stockholm DAGENS NYHETER in Swedish 20 Jun 80 p 19

[Article by Bo G. Andersson, scientific journalist: "Lack of Personnel a Threat Against Radiation Protection"]

> [Text] In the future, the National Institute for Radiation Protection, SSI, will not have the capacity to perform recurrent measuring of radiation in fish, milk and crops from the vicinity of the nuclear powerplants. This is the opinion of the institute, quoted in a memorandum which was handed over to the Department of Agriculture last Thursday.

In the memo SSI demands 15 new appointments. Such a reinforcement would "remove the most striking deficiencies and relieve the institute of the acute problems, which now seem insurmountable," it is stated.

"There is a large gap between the expectations regarding the institute and the actual amount of work we have the strength to perform," says Bo Lindell, Head of SSI, to DAGENS NYHETER.

Even among the Members of the Riksdag there is a misconception regarding the present capacity of the SSI, Bo Lindell thinks.

"Now is the time for the politicians to decide on the level of ambitions for the institute. Another reason for the memo is the mental pressures our personnel has had to endure for several years. We must ease this burden."

Radiation Risk

SSI gives an account of the activities which will be neglected if the required appointments do not come forward.

--Some comprehensive sample tests of radioactive emissions from nuclear powerplants into the air and the water cannot be performed. Nor may the recurrent measuring of radiation in fish, milk and crops from the vicinity of the nuclear powerplants be executed.

--There is also a lack of resources to improve radiation protection for X-ray personnel in the hospitals.

--Studies regarding the effects of examinations based on ultrasonic sound cannot be undertaken.

"Presently, when a new radiation problem occurs and we are forced to perform an emergency mission, e.g. to rapidly formulate instructions, the major part of our remaining activities will have to be discontinued," says Bo Lindell.

Giving examples of matters which have required large resources, Lindell cites the radon in dwellings and the problems regarding the solaria.

"For several years SSI has fruitlessly required an increase in the number of appointments. During the same period the public consciousness and also that of the politicians has increased greatly as to radiation risks in the environment, i.a. through the debate concerning nuclear power and radon."

"Whipping Boy"

"The institute is now like a cake that has been cut from all directions until the pieces have become so small that the person being invited will be dissatisfied,"--a quote from the statement to the Department of Agriculture.

"The institute's activities in the medical field will be the real 'whipping boy' if the resources of the institute do not expand," thinks Lindell.

"But it is not impossible that the county councils will take over the responsibilities, e.g. for testing the X-ray equipment." SSI is negotiating with the Landstingsförbundet [the Association of County Councils] with the intention to give the institute a good deal of relief in the above-described way.

The need for new appointments is now also augmented due to the decision to expand nuclear power. At the Department of Agriculture there is, at this moment, a discussion going on as regards the acceptance of the institute's demands in this respect--concerning 7 out of 15 appointments.

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